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January 2, 1995 • #132

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The Eighth Annual MicroTimes 100

Movers, Shakers, Good Citizens, And Others Who Made A Difference In The Computer Industry In 1994

MAN OF THE YEAR

Netscape's Marc Andreessen

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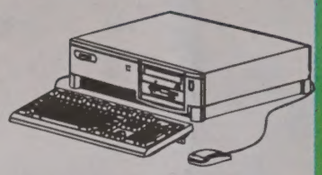
MultiMedia & Beyond—

Providing Information And Resources To The Producers & Consumers Of Multimedia. See Inside!

COMPAQ

COMPAQ 486SX2 66MHz



PRESARIO 720 CDS MULTIMEDIA SYSTEM

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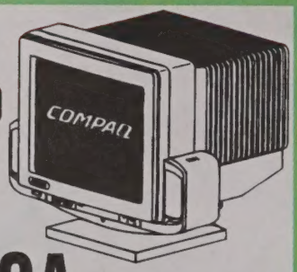
COMPAQ



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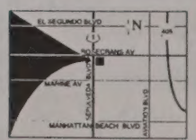

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- 1.44 floppy disk drive *(1.2 MB optional)*
- 14" .28dp SVGA-NI monitor, 1280x1024
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- 2 serial, 1 parallel & 1 game ports
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- 1.44 floppy disk drive *(1.2 MB optional)*
- **15" flatscreen**, 1280x1024, .28dp
- **Fast 32-bit PCI video** accelerator, 1 MB
- High-res mouse ● Compact mini-vertical case
- 2 serial, 1 parallel & 1 game ports
- Microsoft DOS 6.22, Windows 3.11

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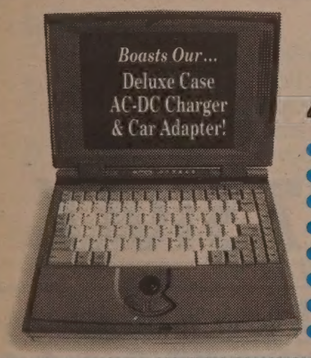

486DX 33 $1397

4 MB RAM ● 260 MB HD ● 9.4" LCD

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- **260 MB removable** IDE HD *(opt. 540 MB)*
- 1.44 floppy drive ● **Two PCMCIA slots**
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- Built-in **large trackball,** center-mounted
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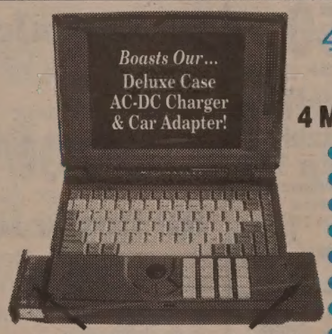

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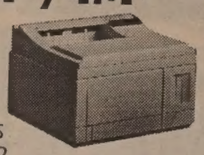

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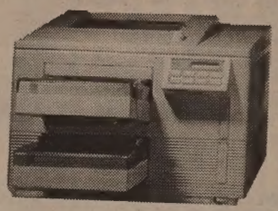

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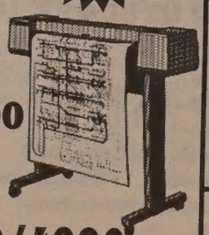

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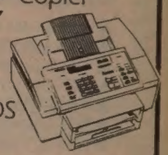

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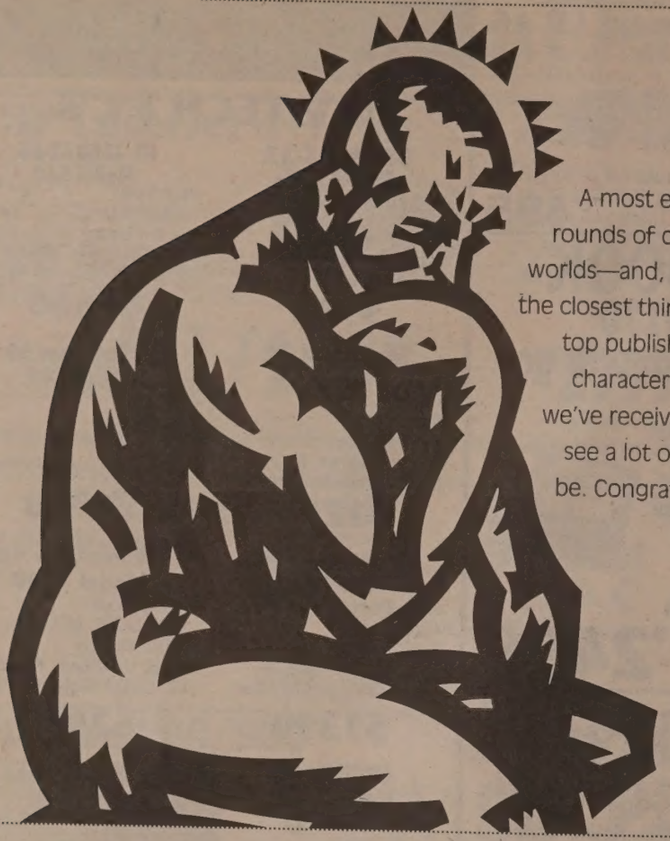

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The Eighth Annual MicroTimes 100

A most eventful year, 1994 saw the disappearance of former industry giants, new rounds of chip wars, a great deal of interaction between the technical and political worlds—and, most of all, Internet fever. Publishing on the World Wide Web was clearly the closest thing to the proverbial Killer Application we've seen since the advent of desktop publishing a decade ago, and in similar fashion it brought a whole new cast of characters and set of issues into prominence. For all these reasons, and because we've received some truly excellent suggestions from readers for this year's list, you'll see a lot of new faces in this year's MicroTimes 100. This is, we think, how it should be. Congratulations to our distinguished honorees, and many thanks to all you readers for telling us about them.

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Man Of The Year Interview: Mark Andreessen

BY MICHAEL ROBIN
COVER PHOTO COURTESY OF NETSCAPE

A visit with the chief author of NCSA Mosaic and Netscape, which drove the explosive growth of the World Wide Web during 1994.

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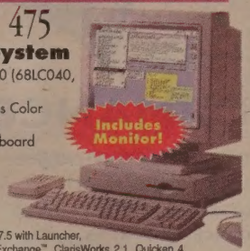

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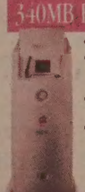

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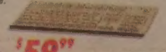

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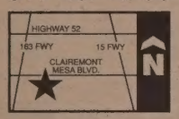

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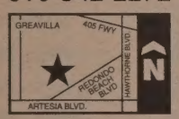

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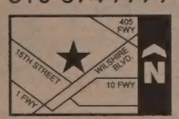

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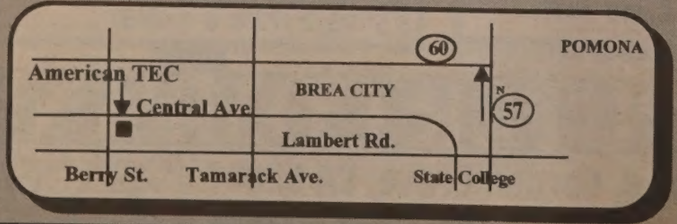

What Intel Should Do. One Person's Opinion

Your magazine is probably being read by many potential Pentium buyers. It is thus important that you publish a balanced report on the Intel Pentium bug.

Intel is trying to downplay the Pentium FDIV bug for obvious reasons. Recalling two million CPUs costs money. Intel's official statements about the rareness of the bug are misleading: One in nine billion cases is not so rare on a fast machine. In fact, some postings on Usenet prove the error to occur twice an hour when doing repeated random divisions on a 90MHz Pentium machine.

Moreover, with Intel doing anything it can to avoid replacing CPUs, and with the dismal failure of the media to publish anything but Intel official statements, there are some facts that should be brought up.

1) The Pentium fails to work according to specifications (the IEEE floating-point standard).

2) Intel knowingly concealed this fact from millions of unsuspecting customers after it found out about it, in June 1994. These customers include many relying on their floating-point calculations to be correct. That's scandalous.

3) The bug is not as rare and insignificant as Intel officials would like the media to believe. There have been hundreds of reports on the Internet proving that the problem can manifest in very simple divisions, including, but not limited to, loan payments bearing interest rates. In fact, every floating point calculation that involves a division is suspect of incorrectness.

4) Customers who bought a buggy Pentium have already lost money: the resale value of their expensive machines has already dropped as a result of the publicity about the bug.

5) Anyone with a buggy Pentium CPU can never be certain that the bug will not strike sometime during the usage of the machine. It may also have happened in the past and gone unnoticed, not because the error was small, but simply because users tend to believe what their computer is telling them.

There's only one fair resolution. Intel should replace the CPUs of all those buyers who request it. This will be a great boon to Intel's credibility.

Ariel Faigon
via Internet

For in-depth analysis of this complex matter, see Paul Hoffman's discussion of the Pentium bug in Industry Insight this issue. For Pentium jokes, see Dvorak's column.

Interestingly enough, at the recent PC Outlook conference, several hardware vendors reported that orders for Pentium-based systems were actually up since news of the bug emerged in the press. This fact did not keep Intel's competitors from enjoying themselves at the standard-bearer's expense...

—eds.

Plug 'N' Play Revisited

The letter in our November issue in which reader D. Bennett took exception to claims about the "plug and play" nature of the Macintosh environment seems to have struck a nerve....

continued on page 37

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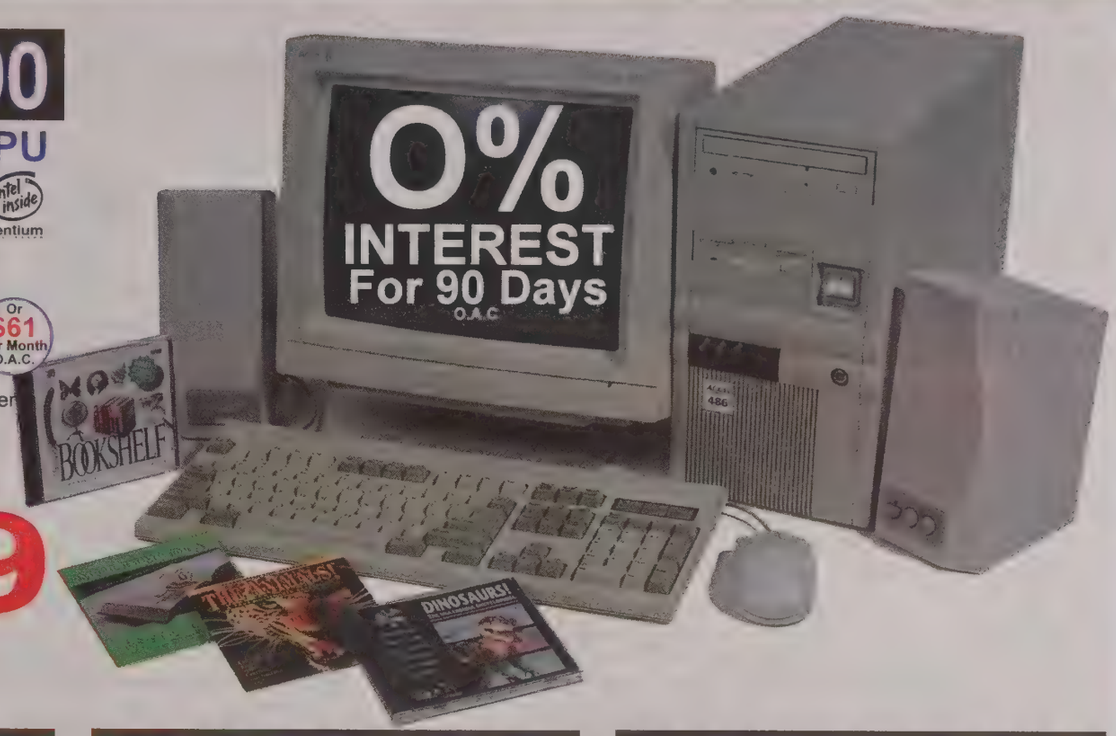

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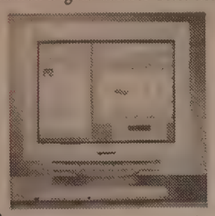

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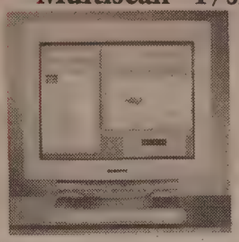

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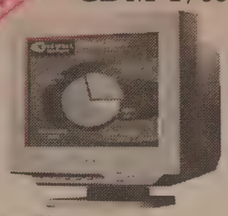

- **Mac Compatible**
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- Unique ASIC design automatically adjusts image geometry parameters across a continuous range of scan frequencies
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- Easy-to-use digital control of screen images
- Includes color temperature control for publishing, photography, imaging, and design applications
- Swedish MPR II compliant

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Multiscan® 15sf

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- 15" Digital Multiscan® computer display with 14.0 maximum diagonal viewable area
- Trinitron® technology delivers bright images and vibrant colors
- .25mm Aperture Grille pitch
- EPA Energy Star and MPR II compliant
- Supports PC and Macintosh resolutions from VGA to 1280 x 1024 at 60Hz
- New design feature simple control buttons and minimizes footprint
- Includes color temperature control #SON-15SF

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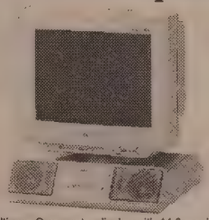
CPD-15sf w/speakers



- 15" Digital Multiscan ® computer display with 14.0 maximum diagonal viewable area
- Trinitron® technology delivers bright images and vibrant colors
- .25mm Aperture Grille pitch
- EPA Energy Star and MPR II compliant
- Supports PC and Macintosh resolutions from VGA to 1280 x 1024 at 60Hz
- New design feature simple control buttons and minimizes footprint
- Includes color temperature control
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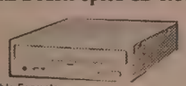

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-Sony SLCD AT-type Bus
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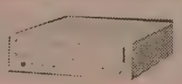

•Compatible Formats	-CD-Digital Audio
-MPC II	•Interface
-Single and Multisession Photo CD	-SCSI-2 bus
	•Average Access Time
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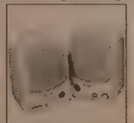

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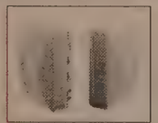

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- UNITEK Enhanced 101 Keyboard
- Microsoft Compatible Mouse, Mouse Pad
- Mid Tower Case w/CPU Fan

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- SVGA Card 1MB
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- Teac 3.5" 1.44 Floppy Drive
- UNITEK Enhanced 101 Keyboard
- Microsoft Compatible Mouse, Mouse Pad
- Mid Tower Case w/CPU Fan

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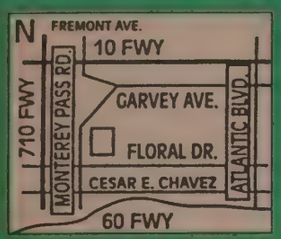

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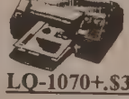

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486DX2-66 Multimedia

Intel 486DX2-66 CPU
486DX2 Vesa w/ 256K
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VESA SVGA Video w/ 1MB
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486DX2 VESA w/ 256K
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Stealth64 2MB DRAM	195
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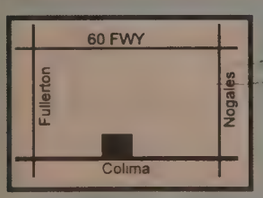

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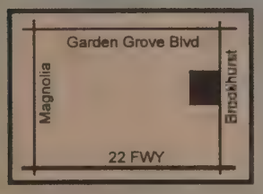

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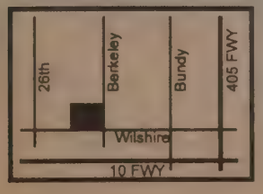

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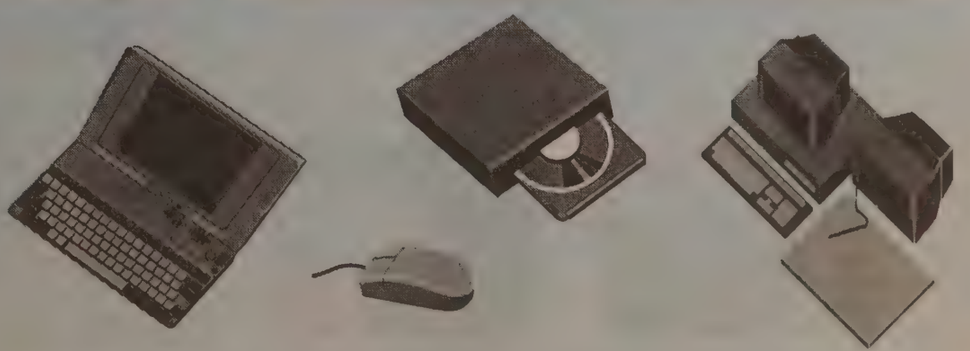

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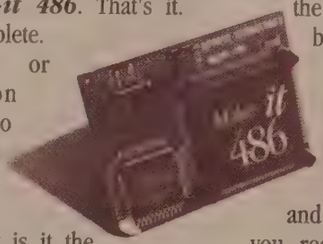

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BY PAUL HOFFMAN

Industry Insight

Intel Gets A Dose Of Bad Publicity
The Ripple Effects Of The Pentium Problem

A recent well-publicized bug in the Pentium processor's floating-point math unit has unnecessarily scared many users and caused Intel a great deal of woe.

Starting with a discussion on a few Usenet news groups on the Internet, the debate about the seriousness of the problem grew incredibly quickly. Possibly everyone's looking for something to talk about, or to worry about, because the bug would actually affect only a very small number of Pentium users. On the other hand, Intel's response is probably a much larger concern.

A Specialized Bug

Essentially, the problem only appears if you divide by a few specific numbers using the floating-point routines in the Pentium, and you require that the result be highly accurate. As you might imagine, very few typical Pentium users have this situation come up very often. The vast majority of users who use floating-point math need calculations that can be quite inaccurate by CPU standards. In such fields as accounting, it is incredibly more likely that you will get detectable errors from data entry than from this bug in the CPU.

This is not to say that there aren't people for whom the bug is serious. People doing simulations using large numbers of calculations could definitely be affected by the bug, and they have been the most vocal in their anger at Intel. Many expressed anguish at the idea that they will have to run their calculations again on different systems, such as 486s or PowerPCs, or on newer Pentiums that have the bug fixed.

Unfortunately, they are missing one very important point: Who's to say that those CPUs don't also have other obscure floating-point bugs that won't be found until later? It's not like Intel forgot to test the chip before they started manufacturing, but simply that they did not (some would say, could not) find all the floating-point problems through exhaustive testing.

In fact, no one noticed the bug in the first few revs of the Pentium processor, used in many millions of systems. As Intel points out, they tested the floating-point math routines in the Pentium harder than they had any other CPU because they changed the algorithms from the 486 CPU and wanted to be sure to catch whatever they could during the processor's design. After the processor had been out a year, they found the bug, and were able to classify how to reproduce it. They changed the design of the silicon that goes into the Pentium to fix the bug, but didn't alert anyone of the bug and didn't identify the new chips as being any different from the old ones. Intel has a stated policy of not announcing any such bugs, even to the technical trade press.

Intel's Attitude

This last bit is where Intel got into serious hot water when the bug was reported in the outside world. People who didn't understand how rare the bug is, or didn't believe that it was so rare, were furious that they might have bought a "bad" processor. Intel's assurances that the bug would only happen once in nine billion floating-point divides (again, something that few typical users ever do with the precision needed to find the bug) didn't seem to make anyone happy. The fact that you don't know whether buying a new Pentium system would fix the problem (it might have an old CPU in it) makes the anguish worse for these people.

> Intel's statement that it would replace the CPUs for the people who "need" them probably got people angrier than anything.

Intel's next statement, that it would replace the CPUs for the people who "need" them, probably got people angrier than anything. What people were most upset about was not knowing which calculations that they had performed (if any) had gotten wrong results. They paid good money for their machines, and they want ones that are always "right." To be told that they had to prove to some Intel engineer that they were performing "enough" floating-point divides with high degrees of precision was too much, and talks of lawsuits appeared in most of the online discussions.

As Michael Slater, publisher of the industry magazine *Microprocessor Report*, points out, Intel's lack of announcement leaves those people who were indeed affected by the bug in a terrible situation. Because of the bug's nature, any results that have been generated by machines with the problem are now suspect and probably have to be redone. If Intel had made the announcement in a timely fashion, these people could have saved months' worth of work. This may only be a few hundred or thousand people, but they are working all over the world on software problems that are quite critical for things like building and transportation safety. They can redo their work on newer systems without the flawed Pentium, but it will mean a great deal of aggravation and lost work.

Ubiquitous Bugs

On the other hand, should these people have been completely trusting their Pentiums in the first place? Just because this has been the only announced flaw, it doesn't mean that it is the only flaw that Intel has found. Nor does it mean that

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Industry Insights *continued*

other CPUs that they might have used instead were not flawed in some other subtle but significant way. Some CPU manufacturers announce bugs of this nature, others do not.

As Slater points out, this kind of bug could not exist in most RISC CPUs because the whole idea of RISC is to reduce the number of instructions that the CPU can perform, and few if any RISC CPUs do floating-point divides. Instead, they leave that to system software. At first, this may seem like a good argument for switching to RISC CPUs. On further thought, however, it becomes clear that the exact same subtle bug could have appeared in the operating system or compiler software as it did in Intel's silicon. Sure, it would be easier to replace the software than the CPU, but it is also much more likely that Intel would have found the bug than, say Microsoft. Intel tests its floating-point routines by setting up dozens or hundreds of PCs running and checking every possible combination: What is the chance that an operating system vendor or a compiler vendor uses the same diligence?

What the current issue brings to light is the fact that CPUs are just as much software as software is. The Intel bug might have been caused by faulty logic on a programmer's part, just like faulty logic that exists in almost all of the software that we run every day. The bug could have also been introduced by accident in the translation from software to silicon, just as software manufacturers often find bugs that appear not in their code, but in a faulty compiler during the translation of their programming code into machine language.

What's A Pentium User To Do?

Regardless of where the bug appeared, it is clear that it only affects a very small number of Pentium users, but it might affect those few users in a serious fashion. Worse yet, there is no visible way of telling whether or not the bug exists on your system: you have to run a test program and examine the results. Intel chose not to change the look of the Pentium with the fixed code because they didn't want anyone to know that the bug existed in the first place. They (probably correctly) predicted that people would overreact to the announcement, and therefore didn't make any external change to the new Pentium chips. This means that people buying Pentium systems by mail order are at a significant disadvantage to those who can stand in the store and run the test before buying.

This leads to another very difficult problem: How can Intel rectify the problem for those few people they do swap CPUs for? You can't just pop open your PC and pull out the Pentium. For one thing, the physical design of the Pentium and many other modern CPUs makes it much harder to insert and remove than the old 386s. You need special tools to do this, meaning that you would have to take the computer to the store where you bought it or ship it to their repair depot. Assuming that the technical people at your dealer could handle the replacement (not a good assumption), you would still probably be without your computer for many days. Also, how likely is it that your dealer would want to do this for you for free? The defect was Intel's, not theirs, or so their logic might go.

What Intel failed to see is how our current mania with precision could make people worry more about some obscure bugs than more likely situations like bugs in software and misreading the screen. People have started to see their computer as part of their being, and if a part of their being has even tiny symptoms of flaws caused by external sources, they will often attack it without regard for the side effects, all the time ignoring other larger flaws that come from inside.

Those people wanting Intel to "fix it" for them when there are likely to be much larger systemic problems that they are ignoring are not that different from those who try to fix political problems by changing the politicians in Congress instead of just admitting that the problems will require personal attention from all of us.

Not that this leaves Intel with many options. It is likely that Intel will choose to replace whole systems for some people, or just the motherboards for others. Either way, it is likely that you will have to prove to Intel that you need the replacement. They can't replace everyone's CPU, and they shouldn't.

They could have been more honest about the problem when it first arose, and spent time proving that it wouldn't affect almost everyone. They could have been more honest all along about the fact that all CPUs have errors, but they're much less likely to be serious than normal software errors. If they had been more candid earlier, they wouldn't be put in their current ugly situation. ■

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Industry Insights *continued*

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	SOFTWARE											
OTC	Adobe		ADBE	36.38	33.50	-2.88	-7.90	24	0.20	0.60	38.50	19.75
OTC	Autodesk	(H)	ACAD	33.88	38.25	4.38	12.92	29	0.24	0.63	40.00	21.13
OTC	Borland	(L)	BORL	10.50	8.38	-2.13	-20.24	-	0.00	0.00	16.00	8.13
OTC	Informix	(H)	IFMX	27.25	26.94	-0.31	-1.15	30	0.00	0.00	29.88	14.25
OTC	Lotus		LOTS	37.50	39.75	2.25	6.00	-	0.00	0.00	86.50	29.75
OTC	Microsoft	(H)	MSFT	61.63	63.38	1.75	2.84	32	0.00	0.00	65.13	39.00
OTC	Novell		NOVL	17.00	16.13	-0.88	-5.15	26	0.00	0.00	26.63	13.38
OTC	Oracle		ORCL	44.19	38.50	-5.69	-12.87	37	0.00	0.00	46.50	26.25
OTC	Software Publishing		SPCO	5.38	4.50	-0.88	-16.28	-	0.00	0.00	8.50	3.00
OTC	Symantec		SYMC	16.81	17.88	1.06	6.32	105	0.00	0.00	19.63	9.88
	HARDWARE											
OTC	Apple	(H)	AAPL	42.75	37.25	-5.50	-12.87	14	0.48	1.29	43.75	24.63
OTC	AST Research		ASTA	12.13	14.63	2.50	20.62	98	0.00	0.00	33.00	10.38
NYS	Compaq	(H)	CPQ	38.75	38.63	-0.13	-0.32	13	0.00	0.00	42.13	24.16
NYS	Digital Equipment		DEC	30.25	34.75	4.50	14.88	-	0.00	0.00	38.13	18.25
OTC	Dell	(H)	DELL	41.88	38.38	-3.50	-8.36	16	0.00	0.00	47.38	19.13
NYS	Hewlett-Packard	(H)	HWP	95.88	95.88	0.00	0.00	16	1.20	1.25	102.50	71.88
NYS	IBM	(H)	IBM	74.13	70.13	-4.00	-5.40	20	1.00	1.43	76.38	51.38
NYS	Silicon Graphics	(H)	SGI	30.25	29.63	-0.63	-2.07	29	0.00	0.00	33.13	18.75
OTC	Sun Microsystems	(H)	SUNW	32.25	34.13	1.88	5.81	15	0.00	0.00	34.50	18.25
NYS	Xerox		XRX	102.00	97.25	-4.75	-4.66	16	3.00	3.08	112.75	87.63
NYS	Tandy		TAN	43.75	46.75	3.00	6.86	18	0.60	1.28	50.75	30.75
	CPU'S											
NYS	Advanced Micro Devices		AMD	25.88	23.13	-2.75	-10.63	8	0.00	0.00	31.75	16.75
OTC	Intel		INTC	60.50	59.50	-1.00	-1.65	10	0.24	0.40	73.50	56.00
NYS	LSI Logic	(H)	LSI	39.38	41.63	2.25	5.71	25	0.00	0.00	45.38	14.25
NYS	Motorola	(H)	MOT	56.38	56.25	-0.13	-0.22	24	0.40	0.71	61.13	42.13
	COMMUNICATIONS											
NYS	AT&T	(L)	T	53.13	51.63	-1.50	-2.82	17	1.32	2.56	57.13	47.25
NYS	BellSouth Corp.	(L)	BLS	51.38	53.88	2.50	4.87	20	2.76	5.12	63.50	50.50
OTC	MCI	(L)	MCIC	22.50	18.25	-4.25	-18.89	14	0.10	0.55	29.00	18.25
NYS	Northern Telecom		NT	35.50	32.75	-2.75	-7.75	29	0.36	1.10	37.75	26.00
NYS	Pacific Telesis		PAC	31.25	29.13	-2.13	-6.80	26	2.18	7.48	33.75	28.25

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER
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DECLINES	19
UNCHANGED	1
NEW HIGHS	12
NEW LOWS	4

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MICROTIMES STOCK INDEX	5478.47	5370.37	-108.09	-1.97
DOW JONES INDUSTRIAL AVERAGE	3875.15	3807.19	-67.96	-1.75
STANDARD & POOR'S 500 INDEX	465.85	458.80	-7.05	-1.51
N.Y.S.E. COMPOSITE	255.57	250.54	-5.03	-1.97
NASDAQ COMPOSITE	767.47	729.07	-38.40	-5.00

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04/29/94	4639.86	3668.31
05/27/94	4709.29	3757.14
06/24/94	4238.94	3636.94
07/22/94	4577.29	3735.04
08/19/94	5070.19	3755.11
09/16/94	5323.66	3933.35
10/27/94	5478.47	3875.15
12/16/94	5370.37	3807.19

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Shareholders headed for the hills last month in a mass exodus that left US stocks staggering in its wake. A quick glance at the stocks in the accompanying table shows a group of high-tech stocks that were beaten black and blue. And nowhere was this beating more evident than in the MicroTimes Stock Index, which fell 108.09 points, or 1.97%, before calling it quits at 5370.37. In comparison, the Dow Jones Industrial Average fell 67.96 points, or 1.75%, before coming to rest at 3807.19. The reasons for the dramatic sell-off last month: heightened worries about a slowing national economy coupled with fears that higher interest rates will hurt corporate America's profits.

Borland's share price fell another 20.2% on top of its previous monthly loss of 15.2% before it finally came to rest at $8.38, but not before it hit a new 52-week low of $8.13 during the period. The stock, which once traded as high as $83 a share two years ago, is now at historically low levels. Borland's latest setback: the company is having trouble selling its dBASE for Windows program. For the trading period, Borland was the largest percentage-loser of the lot.

AST Research, in stark contrast, rallied a robust $2.50 a share, or 20.6%, en route to a close of $14.63. The stock rallied amid bullish comments from Oppenhiemer & Co. analyst Jim Pyner, who said, "The odds of them returning to profitability in the March quarter looks pretty good. The stock is still the best buy in the group." AST is the sixth-largest PC maker in the country. AST's stock traded at $33 in February of 1994.

MCI Communications traveled a southerly route, falling $4.25 a share, or 18.9%, to conclude matters at a new 52-week low of $18.25. Last month, Prudential Securities analyst Michael Elling began coverage of the company by issuing a "hold" recommendation. MCI Communications was the recipient of a "hold" rating because it faces regulatory hurdles in its attempt to enter the local phone market, among other issues. Said the analyst, "Near-term regulatory and wireless uncertainties, combined with an ambitious capital program and slowing unit growth" led to the neutral opinion. ■

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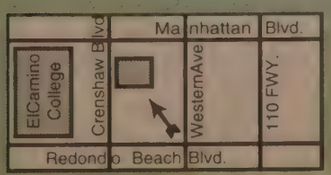

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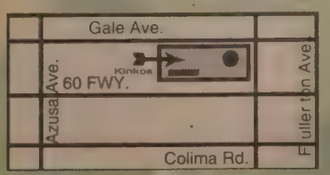

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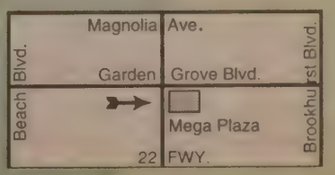

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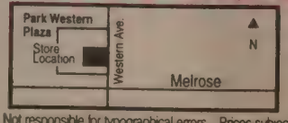

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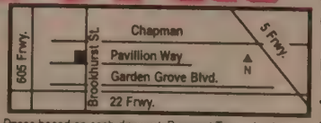

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Citizen Action Can Control Nation's Wiretap System

The last column (Issue #129)—ever-so-diplomatically captioned, "The Death of Freedom and Privacy in America"—was written only days after Congress mandated that a national wiretap system be created, and allocated half a *billion* dollars to pay for its implementation within four years.

The law, H.R. 4922, was introduced August 9; fast-tracked through Congress in less than two months by suspending the rules and after only one or two trivial committee hearings; passed by unrecorded voice vote in the House on October 5, and unanimous consent in the Senate on October 7—literally minutes before they adjourned their second 1994 legislative session; and, ever-so-quietly signed into law by President Clinton on October 22.

All of it was done with almost no mention in the public press—much less any national discussion of its Orwellian ramifications.

The Law, Verbatim

To review: The law states that it is "to make clear a telecommunications carrier's *duty* to cooperate in the interception of communications for law enforcement purposes, *and for other purposes*."

It requires that "a telecommunications carrier shall ensure that its equipment, facilities, or services that provide a customer or subscriber with the ability to originate, terminate, or direct communications are capable of—

"(1) expeditiously isolating and enabling the government, pursuant to a court order *or other lawful authorization*, to intercept, to the exclusion of any other communications, *all* wire *and electronic communications* carried by the carrier within a service area to or from equipment, facilities, or services of a subscriber of such carrier concurrently with their transmission to or from the subscriber's equipment, facility, or service, or at such later time as may be acceptable to the government;

"(2) expeditiously isolating and enabling the government, pursuant to a court order or other lawful authorization, to access call-identifying information that is reasonably available to the carrier—

"(A) *before, during, or immediately after the transmission* of a wire or electronic communication (or at such later time as may be acceptable to the government); and

"(B) in a manner that allows it to be associated with the communication to which it pertains ...;

"(3) *delivering intercepted communications and call-identifying information to the government*, pursuant to a court order or other lawful authorization, *in a format such that they may be transmitted* by means of equipment, facilities, or services procured by the government *to a location other than the premises of the carrier*; and

(4) facilitating authorized communications interceptions and access to call-identifying information *unobtrusively* and with a minimum of interference with any subscriber's telecommunications service and *in a manner that protects...information regarding the government's interception* of communications and access to call-identifying information."

(Italicized emphasis added.)

The full text of the bill, plus extensive other information, is available online from the Electronic Frontier Foundation (ask *eff@eff.org*), and you might be able to get a copy from your elected Congress-critter—if you are properly subservient in pleading for a copy.

Wiretap Anyone From Anywhere

The idea is that the telcos' digital switches will be reprogrammed so they can undetectably route "copies" of all calls of targeted callin or called-parties to any specified government listening station around the nation.

The system can be used by every local, state, and national government employee operative; bureaucrat; political appointee; and elected politician who can obtain legal or illicit access to it and is willing to use it—only as authorized, or for personal or polit-

Half a billion dollars—plus probable phone-rate increases (repeatedly referenced in the bill)—so government snoops won't have to go to a telco office to do their eavesdropping.

ical gain if they dare.

Half a billion dollars—plus probable phone-rate increases (repeatedly referenced in the bill)—so government snoops won't have to go to a telco office to do their eavesdropping. Note: Reportedly, there were less than one thousand *authorized* wiretaps in 1993, of which FBI Director Louis Freeh has variously stated that eighty to less than two hundred used the digital-telephony technology that was the original official excuse for this massive system.

The Democratic administration that so eagerly sought the bill must have a new motto for the nation: "Land of the Freeh; home of the bray."

It Really Is As Bad As It Sounds

Just think of how this system might have been used by Richard Nixon (Watergate), Lyndon Johnson (who used the IRS to attack his political opponents), or unremovable FBI Director-for-life J. Edgar Hoover— who compiled the tens of thousands of surveillance reports on the nation's law-abiding political leaders and opinion makers that still remain, even after his staff destroyed thirty-five file cabinets of suddenly unneeded dossiers upon his death.

Or by Soviet spy Aldridge Ames (high CIA official for years), national-security officials Ollie North and John Poindexter, the thirteen hundred IRS employees that the Service recently reported investigating for abusing their access to confidential files, or the tiny-but-dangerous fraction of police officers who are disciplined or prosecuted annually for abusing their positions.

Think of how eagerly this probably imperfect public wiretap facility must be awaited by foreign spies, industrial spies, and the computer hackers and phone phreaks who have cracked almost every public telecom system in the nation—if we are to believe all those high-profile law-enforcement horror stories about crackers and phreaking that air on Geraldo and sweeps-week news shows.

Puny Protection Against Abuses

This law says, "A telecommunications carrier shall ensure [but without penalty for failure] that any interception of communications or access to call-identifying information effected within its switching premises can be activated only in accordance with a court order or other lawful authorization and *with the affirmative intervention of an individual officer or employee of the carrier* acting in accordance with regulations prescribed by the Commission."

That's it. That's the entire section entitled, "Systems Security and Integrity."

Could operatives under Nixon, Johnson, Hoover, North, Poindexter, IRS officials, or CIA administrators probably falsify authorizations, bribe or blackmail some telco employee in the nation, or just have one

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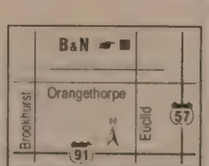

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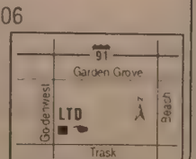

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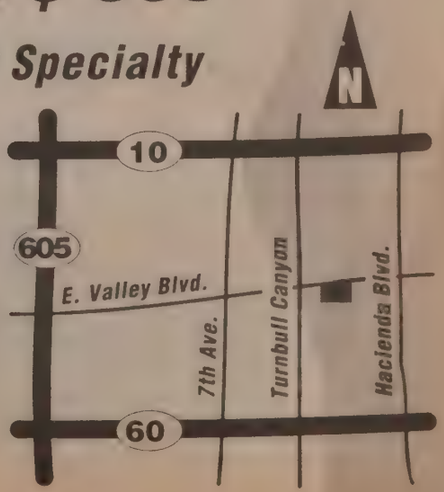

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who's a friend—who would take the "affirmative" action to enable a wiretap? That is, if they couldn't figure out how to hack the system like so many teenagers have done?

But Wiretaps Are Needed

Some wiretaps *are* needed for legitimate law enforcement and national security uses—even if the FBI did ignore its wiretap warnings of the World Trade Center bombing.

They could do what they have done—climb a pole or go to a switching center and clip on. And ISDN handsets capable of decoding digitized conversations are available for a few hundred dollars.

But the law's passed, and the half-billion's allocated, "to remain available until expended." (That's also a requirement in the law.)

No Balance Of Power

The problem is that there's no independent oversight of the uses of this snoop system. It is Executive branch agencies that will have access to it, and those same agencies—under the control of political appointees or elected politicians—will have to police themselves.

The law states that it is "to make clear a telecommunications carrier's duty to cooperate in the interception of communications for law enforcement purposes, and for other purposes."

In the few weeks that this bill was being considered, there were repeated recommendations that it include mandates for Legislative- and/or Judicial-branch oversight. They were systematically ignored, except for some cost and capacity reports.

States Can Protect Their Citizens

Usually, the public and the states are helpless to correct stupid and/or arrogant actions by federal officials. However, this is different:

The states have a long-established authority to control telecommunications operations within their borders—by state legislation and by state Public Utilities Commission regulation. Thus, state legislators or state PUC commissioners can mandate the ***low-cost, easily implemented safeguards*** against abuse that Congress refused to require.

What technology has endangered, technology can defend—cheaply, easily:

1. Monitor the monitors. By state law or PUC regulation, require all telecom carriers within their jurisdiction that implement H.R. 4922 to include automated recording and reporting of all of its uses—just like the telcos now record the dates, times, calling numbers and called numbers for long-distance calls, listing them in monthly phone bills.

2. Restore balance of power. Require that the carriers forward monthly reports of all such wiretaps—just like phone bills—to

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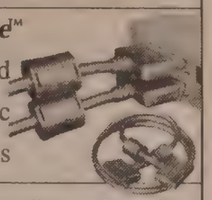

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appropriate state *legislative* and *judicial* oversight agents, and mandate that those agents timely verify the authorizations for all wiretaps thus reported. Logical oversight agents might be the chair of the state legislatures' judiciary committees and the chief justices of the state district appellate courts where each calling number and called number is located.

3. Assure an informed citizenry. Require that the carriers retain those records—for, say, two or perhaps five years—after which they are to print a copy and forward it to the subscriber of each calling- and called-number. This is an automated variation on the citizens' right to know reflected in the Freedom-of-Information Act.

We say we are a free society; let's walk it like we talk it.

4. Restraining orders. Of course, court orders could stay carriers' automated distribution of such reports to oversight agents or to the subjects of government peeps—e.g., if legislators or jurists, themselves, were the subjects of *authorized* surveillance. But even then, the court would be performing the oversight function that is *crucial* if abuse of this draconian system is to be minimized.

Prompt Citizen Action Essential

Although local and state politicians are among those who are most threatened by the potential for powerful insiders to abuse this national wiretap system, they are unlikely to redress the missing balance of power unless citizens and the press help stiffen their backbones:

1. Copy this, and perhaps a hand-scribbled note, to all of your neighbors, friends, business associates, and workplace bulletin boards.

2. Copy this—along with a one-page personal letter summarizing your concerns—to your local talk-radio hosts.

3. Send the same thing to the producers and anchors of your favorite local and network news shows, and to the producers of the national television magazine shows you watch.

4. Send the same to the editorial-page editors, government beat reporters, and high-tech reporters (if any) of your favorite newspapers and news magazines.

5. Send the same thing to your local and state elected representatives—city council members, county supervisors, state legislators, and state constitutional officers (governor, attorney general,secretary of state, treasurer, etc.)—and request a *specific* comment from them stating what they will do. Tell them you will distribute their response—or lack of response—as widely as possible among your neighbors, friends, business associates, and online.

6. Send still other copies to each commissioner of the Public Utilities Commission.

Ballot measure. In all of these communications, point out that we Californians have the ballot initiative as an option to legislative inaction. (I have begun researching that option, and formulating how to use the computer nets to coordinate and facilitate an initiative drive. More details when I have 'em.)

Nothing's changed: **Vigilance—and personal action—is *still* the price of freedom.** ■

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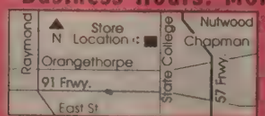

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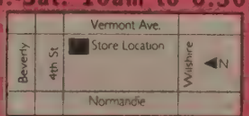

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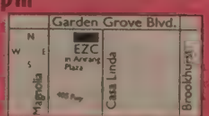

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Letters

continued from page 10

Mr. Bennett, I am afraid you have not the foggiest idea what real plug and play means. I assure you that until very recently the world of the "PC" has not had real plug and play. It can be a real nightmare to plug in a set of boards consisting of sound, SCSI, IDE, Ethernet, serial, parallel, and SVGA into a single PC. The number of jumpers, IRQs, DMAs, addresses, and other bothersome stuff which has to be considered when configuring the system is quite daunting.

You are, however, correct in noting that the Mac certainly was late getting into the plug and play game. This feature existed on certain HP calculators, computers, and printers long before it existed on any sort of personal computer on the mass market.

So far as I know, the first application of true plug and play to a mass market personal computer was the Commodore Amiga in 1985. I have a system which has had two SCSI controllers, serial, parallel, sound, extra memory, processor accelerator, Ethernet, and an extra pair of serial ports all installed at once. The only thing I ever had to configure on any of these cards was the SCSI controller ID (because I was developing software for that card), the Ethernet AUI/thinnet jumpers, and the memory card's memory size selectors.

Everything else was handled for me by the computer as part of its "autoconfiguration" sequence. This sequence goes out and sniffs the cards during the boot cycle. The cards declare what they need in the way of computer resources. Insofar as these resources exist, the card is informed of its allocations and allowed to run its initialization software. The only time this sequence gave any "trouble" was when I tried to run memory cards giving me more memory than the address space of the CPU chip allowed. "IRQ," "IO Address," "DMA," and other typical PC conflicts simply do not exist on the Amigas.

One has to ask why Commodore's Amiga has been overlooked in all the industry hype. One of course must ask why this feature is considered so revolutionary and new when it had appeared on some smaller market machinery well before it appeared on the Amiga.

Perhaps it is time for you and the industry as a whole to take off the blinders and take a very good look around. There are a lot of very good ideas that do not exist yet on the PC or Mac machinery.

Joanne Dow
jdow@bix.com
Amiga Exchange Editor, BIX

D. Bennett doesn't really understand what "plug and play" means. The term "plug and play" means to plug it into the wall (120 AC), turn it on, and it works.

The Mac did it extremely well. My wife (not very computer literate) wrote her thesis on a Mac back ten years ago when it took a computer scientist to run the PC versions of CP/M and DOS.

Kerry Belanger
via Internet

Death Of Freedom And Privacy: Highly Exaggerated?

I for one should be grateful for Jim Warren's success in making state statutes available online. But why is it I wonder that all the idiots and "bastards" are elected representatives of the people in Congress; while all the intelligent and patriotic are on The WELL? And why is it that I find it more difficult to hear the little bit of message when people scream and rave at the top of their decibels?

It occurred to me that if I changed the title of the article of Warren's recent column to fit the message I got, it would read "The Death of Freedom and Secrecy in America."

Basically, isn't the gist of the piece "freedom of secrecy"? So that (getting away a bit from the sacrosanct individual) there can exist and flourish groups or SIGs with their secret or "private" pool of communications?

Isn't freedom about being open to all; you know, something like the sunshine laws? Why, if all stayed free and open, all this terrifying legislation would not be needed; and we could sure use all that money elsewhere.

I have my own kind of paranoia; it fires up when I think that Dialog, one of the largest depositories of information, is now owned by the British; and so is Mead/Lexis which also adds a comprehensive compilation of most of our laws. Some people may trust the British; but what if they in turn sell those resources to the Japanese; and they in turn to an East-block consortium?

Have we failed to see that information is becoming the currency of power and survival in this world, and that it must be monitored and protected like any national resource? Or have we, like Oppenheimer before us, reached the conclusion that we preserve freedom by sharing any piece of information even with those that claim to be our enemies? Let's have some balance.

Antonio M. Fiorentino
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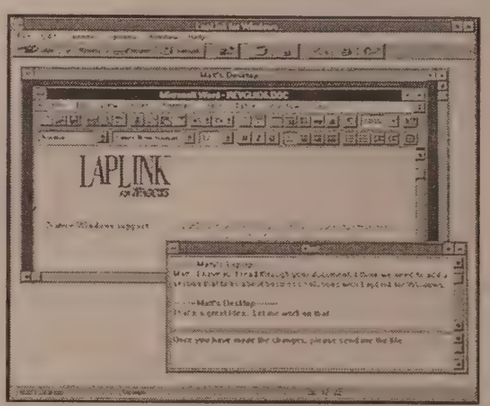
of connecting a portable to a desktop or another portable is essential if you use a portable on the go. In the early days, people would make copies of files on diskettes and then copy the files back and forth between computers. This quickly became cumbersome as the size and number of files we carry around grew. Products were soon developed that helped synchronize the files on our computers and keep everything with the most up-to-date version.

One of the first companies to get into this software niche was Traveling Software, which began offering products to assist portable computer users long before the introduction of the first IBM compatible portables. Traveling Software has consistently improved its products, centering around this basic need of hooking computers together.

LapLink, from Traveling Software, has consistently been my favorite product for linking computers together. When it was first introduced, you connected the computers via a serial cable. This process was made faster by the ability to connect through the parallel ports. Next, the ability to link the computers together through modems was added. On and on it went, with each new version being more powerful. Today, LapLink for Windows is the most powerful and versatile connection product yet.

This newest release in the LapLink family allows you to do all of your work through Windows. There are advantages to this interface—you can work with a mouse and icons to move files back and forth between computers and copy individual files by doing little more than drag-and-drop a file from one computer's directory to the other computer's directory. But there is lots more to this product than a change of interface.

One of the most powerful additions is the ability to access a computer and control it from a remote location. Other products provide remote access, but combining this feature with a file transfer program offers a clear advantage. Not only can you transfer files between distant computers, but you can also run the remote computer as if you were there. This is especially useful for keeping up with email that may have piled up at the office or for selectively tapping into database files that are routinely updated.



One of the features I especially like is the ability to connect into a computer that only runs DOS. Through a setup procedure that takes a little patience to accomplish, you can set up a DOS computer to accept calls from your Windows portable and give you full access. This is useful for technicians who need to work on a distant computer.

Another feature is the ability to communicate with several computers in one session in order to coordinate all of them. While this requires a modem for each computer you are remotely connecting with, it means you can use LapLink in networks to simultaneously install software or data files on multiple computers.

For users working with large database files, lots of time can be saved with LapLink's SpeedSync feature that will transfer only that portion of a database file that is new or changed. So, rather than taking the time to transfer a huge database file, the program will simply update the file on your computer with the missing data. Traveling Software estimates this can give you up to an 800% increase in transfer speeds.

In order to use this software from a remote location, the host computer must be turned on with LapLink for Windows running. When you dial in from a distant location, the host will answer. You can then choose to transfer files between the two machines, run the remote machine from your distant location, or chat with the host operator if there is one. You can type messages back and forth and move freely between the file transfer, remote control, and chat modes. In short, this program brings together a variety of features.

There are, of course, security measures including passwords to prevent unauthorized access to the machine. You can also reset the host computer after you have completed a session. Additionally, you can set up your host machine so that the screen blanks when you access information. This will prevent anyone from watching the information come across the screen as you

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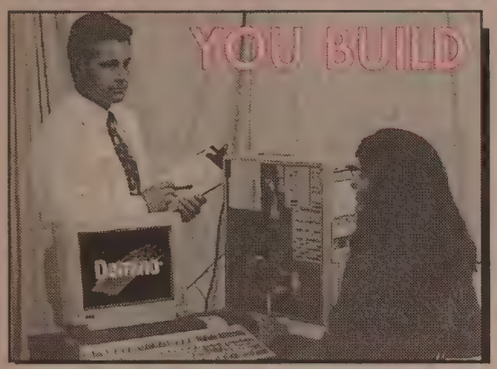

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Other products provide remote access, but combining this feature with a file transfer program offers a clear advantage.

operate the host computer from afar.

A full log is maintained, recording who accessed your desktop computer and which files were transferred. In case the computer you want to connect with lacks the software, it can be transferred via serial cable or over a modem. And finally, if you decide you don't want the software on your system there is an uninstall icon that will remove all of the relevant files. In the days before Windows it was easy to remove unwanted software, but with Windows, files are scattered all over the place.

Traveling Software has included an automatic modem installation module so you will not have to figure out the details of modem connection. After you have installed the software, you can test your modem by registering the product electronically. It is a terrific product. Technical support is available by phone, although there is extensive and detailed documentation and help screens included in the software.

This is the most sophisticated, yet easiest to use of the long line of LapLink products. It is hard to imagine all of this power for $199.95. If you work away from your primary machine, this may be just what you are looking for. It's great to have all of this power in a single package. Upgrades from earlier versions are available for a fraction of the cost.

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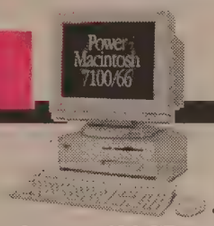

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Laptops *continued...*

Computer Of The Month

NEC's new Versa S Series

NEC has long been a leader in notebook computers. They were the first company to come out with a really light unit and led the rest of the field into notebooks. Their latest entry is the S series which comes in a number of configurations ranging from a monochrome model that weighs under 4 lbs. and is less than 1.5" thick all the way up to an active matrix color model that weighs 4.66 lbs. and measures a little less than 1.75" thick. All models measure a little less than 8.5" x 11."

Each of the models come with a variety of processors that range in speed from 33MHz all the way up to 50MHz. The standard configuration is 4MB of RAM, but this can be increased up to either 8 or 12MB. All models come with a variety of hard drives as large as 350MB. In time, larger drives will also be offered.

NEC is able to pack so much into such a small package because an internal floppy drive is not part of the basic model. A separate 1.44MB floppy drive is included instead and attaches to the computer via a small cable. This setup gives the user access to diskettes while limiting the overall size of the computer. When traveling, it is easy to pack the drive away in a suitcase or simply leave it at home if you will not need to copy to or from a floppy drive on your trip.

The Versa S series is packed with powerful features. The display is a large 9.5" and offers clear resolution. If you prefer, you can attach a color monitor to the system and set it up to either use the external monitor, internal display, or both. It is easy to toggle between these modes. I tried this out with the Nanao FlexScan F340i-W and found it to work perfectly. I still like this monitor and while it is a little more expensive, it is a quality monitor with many features, including energy efficiency.

The keyboard on the Versa S has an adequate layout, but not as good as Toshiba's, which has the PgUp, PgDn, Home, and End

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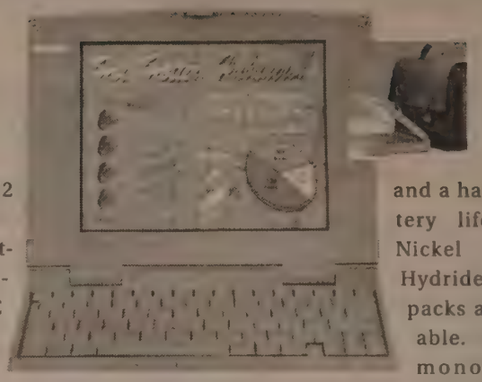

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keys located near the cursor movement arrow keys. While I can't put my finger on what is wrong (no pun intended), I can report that my typing on the Versa S is not as accurate as on others that I have examined. I suspect, however, that it is a matter of getting used to the touch and feel of the NEC.

What I do like about the keyboard is the SurePoint button which takes the place of a trackball. IBM was the first company I saw that used this feature. It is about the size of a pencil eraser and fits unobtrusively between the G, H, and B keys. You push it in the direction you want the arrow to move. The harder you push, the faster it moves. This is an excellent arrangement and you will become very comfortable with it in a short time. For those who like to work in cramped places, this is a real advantage. If you choose to use a conventional mouse, it is simple to attach it to the port on the back that will accommodate either a mouse or a PS/2 compatible keyboard.

Like many new computers, the Versa S also provides PCMCIA slots. NEC designed these slots to accept two cards, Type I or II, a combination or a single Type III card. The difference between the types is their thickness. A Type III card takes up the space of both slots, while plugging into only the lower slot. I had trouble getting my MobileMax Maxtor 131MB hard drive to work, but discovered that I simply needed to push it in farther that I had. The problem did get me to phone NEC's technical support system and learn that it works reasonably well and can be reached through an 800 number.

There are setup features that allow you to control the level of power conservation. However, with an active matrix color display, you should expect only about an hour and a half of battery life. Extra Nickel Metal Hydride battery packs are available. On the monochrome unit, battery life may be as much as two and a half hours. Not particularly long compared to other machines available.

NEC's documentation seemed a little weak to me. It told lots of things I didn't need to be told. Overall, the Versa S is wonderful and includes a three year warranty policy. For the first year, NEC gives an extra warranty that guarantees to return a broken computer within a day. NEC is a name you can trust and this new line of notebook computer is certainly worth looking at. It offers full and powerful features in a small package. ■

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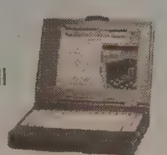

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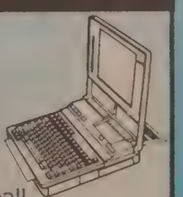

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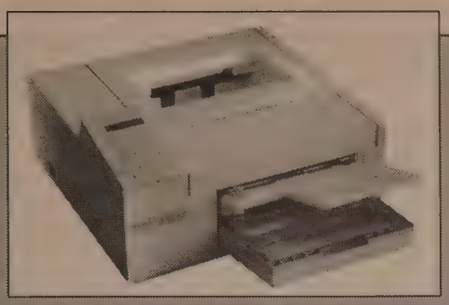

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TELECOMMUTING • BY ROBERT MOSKOWITZ

The Evolution Of Work

The Post-Industrial Revolution Is Creating Technology That Allows A Great Many Workers To Go Back To Their Homes —Or Anywhere Else, For That Matter.

We're at a new point in the evolution of work. At first, all work was done "on the road," as hunter-gatherers made the best living they could from the local environment. Later, all work was done "at home" as farmers grew their own food, or later grew crops and raised animals for sale. A hundred years ago, or so, the best paid work began to be done "in the office"—or the factory—as the industrial revolution created technology that suddenly required workers to travel to a central location before they could be productive.

Today, the post-industrial revolution is creating technology that allows a great many workers to go back to their homes—or anywhere else, for that matter—and in many ways be just as productive as they could be at the central office. Such an approach helps employers increase competitiveness by lowering costs, speeding innovation, and increasing customer satisfaction.

Much as multimedia is now said to portend the death of books, telecommunication has long been hailed as the end of geography.

We have a term for the work that is central to a business or organization and that is done by groups or teams of people who are separated from each other in time or space. We call it: "distributed" work. The out-sourcing of support activities is deliberately excluded from this definition.

However, we can use a slightly broader term, "distance work," to describe not only distributed work but the same general type of activities done by the same type of team when the work at hand is less central to the main mission of a large organization. For example, a one-time project or study by a major organization, or efforts to develop a startup business by a band of entrepreneurs would be distance work rather than distributed work.

In this sense, we can see telecommuting as just one of many possible human resource management methods that allow work to be distributed or done at a distance more effectively.

The vast majority of distributed and distance workers are "knowledge workers." Management consultant Peter Drucker defines such people as those who do work that requires the use of mental power rather than muscle power. Their predominance in distance work will probably be the case for many years, as muscle-based work these days generally involves far too much capital equipment and raw materials to be done efficiently anywhere but at a central location.

But being limited to knowledge work is not much of a restriction. Parts of nearly every job involve knowledge work, and are thus ripe for innovation or restructuring that lets people do them at a distance.

As mentioned months ago, tasks that are perfectly appropriate for distributed or distance work include such intellectual activities as: analyzing, auditing, comparing/contrasting, creating, modifying, planning, problem solving, thinking, and visualizing; plus such physical activities as: contract preparation/analysis, correspondence, data entry/correction/manipulation, designing, filling in/processing forms, meeting via telephone or other medium, numerical/financial calculations, project analysis/management, reading/studying, record keeping, researching/fact checking, sales/contact, telephone answering/customer service, and writing/typing. There are probably more.

While distance work success stories continue to pile up, uncertainties remain. Employers are concerned about how to manage and measure the productivity of distance workers, as well as how to educate and train them to stay in step with evolving corporate procedures, technology, and policies. There are also concerns about coordinating and controlling the work done at a distance from the main office, and about legal issues which—although quiescent so far—potentially pose insurmountable problems for organizations that dare to rely on telecommuting and distance work.

As employers become more comfortable with distance work, the distances are beginning to grow larger. Companies like Dell Computers, Best Western International, American Express, and dozens of others are actually employing people who "telecommute" from one country to another! This arrangement, rare among telecommuters today, is likely to become much more common as corporations battle to retain the most talented employees at the lowest possible cost.

Naturally, I'll have more details on all aspects of this developing phenomenon in future articles.

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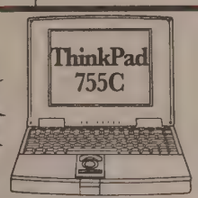

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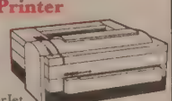

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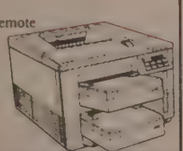

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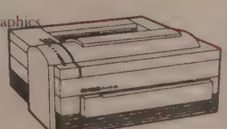

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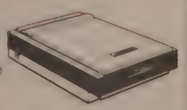

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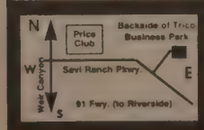

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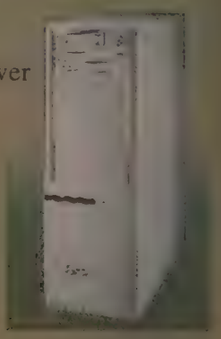

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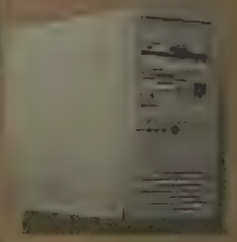

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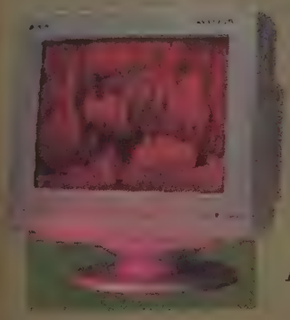

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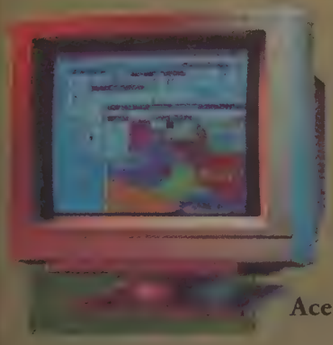

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Telecommuting...*continued*

Paradigm Shift

Much as multimedia is now said to portend the death of books, telecommunication has long been hailed as the end of geography. But so far the opposite has occurred; by making almost any point on Earth accessible for a few dollars via a telephone or a point-and-click menu on a personal computer, the global network has led to the "explosion of place." That's the word from the editors at *TeleGepgraphy*, which does as annual survey of telecommunications markets. Drawing on the results of this survey, the editors go on to say:

In a very practical sense, one can now live, work, maintain relationships, go to school, and even shop almost anywhere on the planet—certainly anywhere within California and the United States—without very much regard to physical, geographical constraints. As network services and resources continue to proliferate and grow easier to use, this phenomenon will only become more, not less, routine.

In a sense, travel or geography has become the common content of computer networks. Hence as the Canadian scholar Marshall McLuhan first noted, rather than obliterating older forms, a new medium takes as its content the medium it replaces. Music and drama were the staples of early radio. Television gave new life to movies. And so telecommunications, particularly voice and data networks, by abolishing the importance of the distance between individuals—whether working or playing—has given us a new online geography of disembodied electronic mailboxes, meeting rooms, malls, highways, and frontiers.

The challenge of navigating this new electronic terrain is attracting the attention of telecommunications companies and computer communities alike. Traffic on computer networks has grown dramatically since the early 1990s, spurred in part by the development of more user-friendly navigational tools or screen interfaces. As Bruce R. Schatz and Joseph B. Hardin wrote in the August 12, 1994, issue of *Science* magazine, computer networks have been transformed from networks of machines into a distributed "information space."

The pair says this means users can now "concentrate on the logical structure of the interconnection of information and data items rather than the underlying physical structure of computer and communication systems." In practical terms, there is plenty of network capacity and very good network connectivity. So the typical user no longer needs expertise at simply navigating the network as much as he or she needs an understanding of how the information is organized and arranged. Network geography has become information geography. Or, to put it more simply, the physical location of the information on a network is almost entirely irrelevant, users are far more interested in identifying the resources they want rather than "finding" them (in the traditional, physical sense).

The problem, of course, is how can users orient themselves in this new information space? According to Zachary Schrag, deputy editor of *TeleGeography*, a publication which chronicles and maps the international flow of telecommunications and which ponders just this sort of theoretical issue, our current text-based interface with computer networks is being challenged by two movements: one offering graphical user interfaces based on geography (geoGUIs) to make network information more visible; another developing "intelligent agents" designed to make the computer networks invisible.

Little is presently said, or known, about how geoGUIs will ultimately operate. Agents, however, are much further along in development. Like computer macros and scripts, agents let computer users automate repetitive tasks such as logging onto a computer system or downloading information from a database. Unlike macros, agents also can go beyond a local computer to the network itself, retrieving information, sending messages, and perhaps even conducting business.

Maps and agents both have a future in cyberspace; the challenge is to know when to use a geoGUI, when to use an agent, and when to use other means and methods to most effectively, metaphorically "travel" the network to one's desired information destinations.

(The above discussion was edited, expanded, and excerpted with permission from *TeleGeography 1994*, published by TeleGeography, Inc., Washington, D.C.)

> ...we can see telecommuting as just one of many possible human resource management methods that allow work to be distributed or done at a distance more effectively.

Report On Governmental Activities

According to Dr. Charles Grantham, of the Institute for the Study of Distributed Work in Oakland, CA, the European Union is much farther ahead than the US and even California in promoting the use of distance work to aid economic development in both suburban and rural areas, as well as to extend the reach of educational institutions farther out from central cities. They're also making progress in using telework for easing the entry of disabled, elderly, and others into the work force.

One reason, reportedly, is money. In its 1995 fiscal year, the European Union is going to spend more than $80 million on programs to help the disabled and elderly do more with telecommuting, and another $60 million to aid small- and medium-sized businesses do the same. This is far

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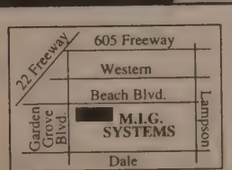

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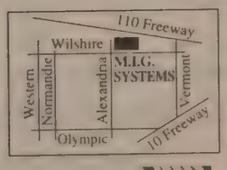

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Telecommuting...*continued*

more seed money than our government is putting into comparable projects, despite what Al Gore tells you.

In addition, the Europeans seem much more organized and focused to Dr. Grantham, who recently spent several weeks visiting and consulting in and around Vienna—one of the "hot spots" for global telecommunications these days.

He claims it is now easier to promote telecommuting between two European nations than between California and a neighboring state, such as Arizona or Nevada. This is downright dangerous, as our country initially grew strong in its formative years by transforming itself into a single market with few if any barriers to interstate commerce. Today, local telecommuting authorities are in danger of getting in each others' way as they battle for limited federal funding, for greater authority, and for tighter control over telecommuting activities within their respective regions.

If you need an example, look no further than Southern California. There, the Telecommuting Partnership sprang up after the January 1994 earthquake to promote telecommuting. It accepted several million dollars from the Department of Commerce, and busily set about doing a "needs analysis" with regard to telecommuting in the region.

A few months later, the Southern California Association of Governments formed the Southern California Economic Partnership, which included a "telecommunications cluster" to promote telecommuting. It accepted a $250,000 grant from CalTrans, and busily set about doing a "needs analysis" with regard to telecommuting in the region.

Both sides claim to be coordinating with all other agencies and government bodies in the region, yet each seems to be building separate but redundant administrative structures and doing separate but redundant investigations into where and how money could best be spent.

One questions whether telecommuting "needs analyses" are focused on the needs of telecommuters, or on the needs of favorably connected telecommuting experts and consultants.

Is it possible, innocent readers, that this could be the beginning of another example of government waste, boondoggling, and outright incompetence that not only fails to promote a needed activity—in this case, telecommuting—but actually impedes progress that independent activists might otherwise make?

I'm hopeful that good work will be accomplished here, of course, and I'll be sure to keep you posted as both of these new but optimistic governmental agencies ramp themselves up to their full size and budgetary limits.

Blue Line Televillage—Update

Thanks to all of you who contacted Los Angeles' Metropolitan Transportation Authority regarding the stalled Blue Line

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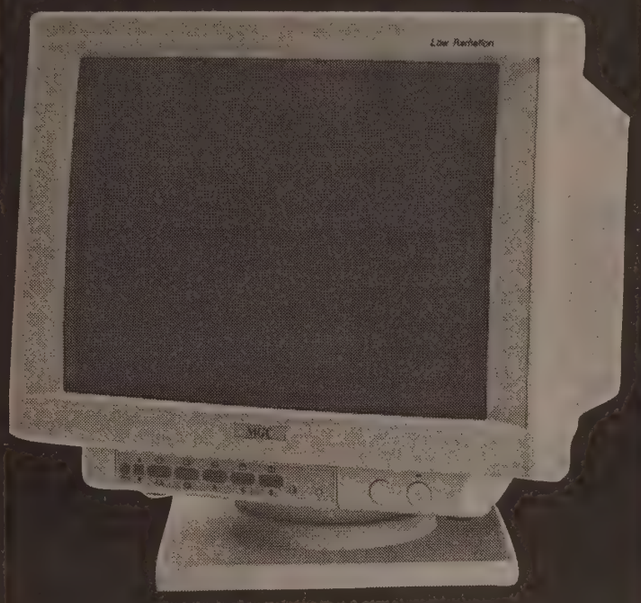

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Telecommuting...*continued*

Televillage Project, as mentioned in a previous article. After much bureaucratic manipulation, funding for the Televillage Project Coordinator's position has at last been found, and the project's $559,000 budget, bolstered by in-kind grants and contributions from participating organizations and institutions, now seems likely to be expended on the experiment.

As you remember, the Blue Line Televillage is considered by many to be "the single most innovative application of telecommuting and telecommunications in the world today!"

It will attempt to make good use of the excess capacity presently available within the fiber optic system initially installed to provide a channel for video security camera signals and other railroad control functions along the Blue Line rail right of way that runs from the downtown area of Los Angeles to Long Beach, some twenty miles away.

Over a period of twenty months, the Televillage project will provide no-fee and low-fee opportunities for residents along the Blue Line to make use of existing and yet-to-be-installed facilities such as workstations, meeting rooms, and a variety of automated devices.

The European Union is much farther ahead than the US and even California in promoting the use of distance work.

As always, I'll keep you posted on further developments regarding the Blue Line Televillage as they occur (or fail to occur).

Global Village '95

A symposium to discuss aspects of building a Global Village is scheduled for February 7–10, 1995, in Vienna, Austria, and I am an invited speaker. This meeting is one in a series of conferences, discussions, and symposia to examine the possible spatial and social patterns that living and working facilities should take on in the information age.

Vienna is a laboratory for experiments along these lines, particularly since rapid development is now taking place in the relatively open lands north of the Danube, an area that offers commuters very limited access to jobs in downtown Vienna because there are only five bridges over the river.

Telecommuting would seem an obvious strategy, and in fact is being examined both by Global Village '95 organizers and the Vienna City Planning Department, with emphasis on its social, physical, and technological requirements. All these concerns will be topics for discussion at the conference.

In addition, there will be a "distributed" public exhibition from February 2 to 10 in Vienna's City Hall and also a large shopping mall some distance away.

Global Village events tend to provide a great deal of "cutting edge" information on both practical and theoretical aspects of telecommuting. You'll get a full report on all this in an upcoming article. ■

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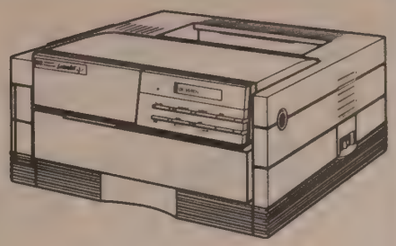

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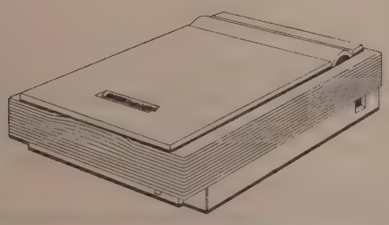

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Sales Tax On Computer Software

To tax or not

to tax computer software? Conflicting legal decisions in different states reflect the difficulty that courts have had in resolving this question. Sales tax controversies often arise over whether it is taxable as a transfer of tangible property, or whether it is a nobler, nontaxable transaction involving intellectual property.

California imposes a sales tax on the transfer of software under some circumstances. The sales tax generally applies to retail sale of tangible personal property and select services. Intellectual property such as the logic or intelligence of a computer program, however, is intangible and therefore eludes the California sales tax.

To put the quandary in perspective, consider that books, VCR tapes, CDs, and records embody intangible rights, but are clearly taxable. The personal services of an architect, gardener, or systems analyst, however, are not. Similarly, sales tax is charged when you buy a box of canned, "off-the-shelf" software at the corner mall. But should a programmer or developer delivering a floppy disk containing months and years of personal services be subject to a tax on tangible property? How does the tax law recognize the difference?

The central guidance is found in a dramatic little text with a snappy title, California State Board of Equalization Regulation No. 1502, Sales and Use Tax Regulations: Computers, Programs, and Data Processing (see endbar).

This gem, which establishes when computer software and output is subject to sales tax, is cited in virtually every court decision involving sales taxation of software. A brief summary is provided here for those in the position of selling, reselling, or buying software or programming services.

Custom Versus Prewritten Software

Off-the-shelf software is taxable. The tax applies to the full amount charged the customer, including license fees, site licensing, other end-user fees, and documentation; as well as maintenance or service contracts that don't cost extra. If, however, the purchaser has an option to pay extra for consultation services, those additional support services aren't taxed.

On the other hand, sales tax does not apply to a custom computer program (other than a basic operational program).

The definition is important here. A custom computer program is defined as "a program prepared to the special order of the customer even though it may incorporate preexisting routines, utilities, or similar program components. It includes those services represented by separately stated charges for modifications to an existing prewrittten program which are prepared to the special order of the customer."

Thus, if you develop software made to order, it isn't taxed even if it includes chunks and dribs and drabs of things that weren't necessarily custom jobs. The documentation you provide with a custom program is also exempt.

In determining whether software is canned or custom, the courts have held that the answer may be "none of the above." Once a program has been created, is in the possession of the original customer, and the design and development completed, the software program itself has become a tangible personal asset. Its subsequent transfer by that buyer will be taxed.

In one impressive local case, Kaiser Industries sold all the assets of its engineering division to another company, including an extensive library of customized programs that they had developed for internal business use. The transfer of the software library was found to be a taxable sale of tangible personal property. Indeed, the regulations specifically command that a "prewritten" (taxable) program includes not only one held for repeated or general sale but "also...a program developed for in-house use which is subsequently offered for sale or lease as a product."

The distinction between tangible and intangible was noted recently in a case decided by the California Court of Appeals, which pronounced that if an item is "(1) not solely the embodiment or expression of an idea, (2) physically useful in the manufacturing process, and (3) not supplied as an incident to providing service, it is taxable as tangible personal property."

Although custom programming services are free of the tax, some defensive bookkeeping by code writers and developers is nevertheless called for. If you charge a client to make minor modifications to prewritten software, those modifications are nontaxable only if your invoice separately itemizes the charges as your services. Forget to do so, and both the program and the modifications will be taxed.

On the other hand, if fees for modification of a prewritten program are not separately stated, and if the changes are so significant that the result qualifies as a new custom program, it won't be taxed at all. A magic formula even specifies that, in order to qualify, the price of the modified program must be at least twice that of the unmodified, canned program you started with. In other words, the value added must

continued on page 184

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OS/2 • BY FABIAN PASCAL

OS/2 3.0: A Warped Versioning Concept?

Plus: Cypress Pentium Notebook And OS/2; Even More Driver Hell

With much fanfare

and hoopla, complete with a Star Trek team member denigrating an hourglass and a worldwide satellite show, IBM has recently launched OS/2 3.0, dubbed Warp.

It has always been my policy to write about products only after thorough use in realistic circumstances; given my experience with previous OS/2 versions, I see no reason to deviate from this practice. I shall review Warp's specific features gradually over time, avoiding the usual instant and rather superficial overviews in the trade press. For now, I will offer some preliminary comments and illustrations, onto which I can hang some updates to previous columns, as is befitting at year's end.

Warp—What's New?

In its guide to reviewers, IBM describes Warp's following areas of improvement:

Installation:
- Easier
- Better Device Driver Support
- Enhanced Application Detection

Usability:
- New Tutorial
- LaunchPad
- WorkPlaceShell Enhancements
- Expanded Cursor Options
- Win32s 1.0 and 1.1 Application Support
- VDM Configuration Enhancements
- Expanded Multimedia Support

Performance:
- Smaller (memory) Footprint
- WIN-OS2 Fast Load

Reliability:
- Configuration Archiving
- Diagnostic Boot Cycle
- Utility Diskette Creation

Value-Added Features: BonusPak
- Internet Connection
- CompuServe Information Manager
- HyperAccess Lite
- IBM Works
- Faxworks
- Person to Person
- Multimedia Viewer and Ultimedia Video IN
- SYSINFO Tool

Looked at in more detail (more of that in future columns), these enhancements are all useful and welcome, but to those of us who have been with OS/2 since its inception they are mainly cosmetic, or long-overdue corrections of weaknesses. Do they really justify a full version point?

Take the usability enhancements. I don't find the LaunchPad (Figure 1) such a big deal when you can have all the icons (and pop-up menus) you want on the desktop; on small notebook screens, floating it on top—the most likely use—interferes with one's work. Or consider the animated folder icons, which now open: nice touch, but hardly substantial.

The installation, performance, and reliability enhancements should not have taken that long. And the BonusPak cannot substitute for the dearth of native, efficient, OS/2-exploiting full-fledged applications in almost all important niches (the FaxWorks Lite in the BonusPak, for example, is a 16-bit version of the application, with generic modem support, which does not support my Intel SatisFAXtion fax modem).

table #1

	Minimal Recommendations	Cypress Notebook 3600
CPU:	>=486/DX4	Pentium
	100MHz	66MHz
	128K cache	Y
Bus	PCI or ISA+VLB	ISA+VLB
PCMCIA	>= 2II/1III	Y
	OS/2 Socket Services	N
Memory	min. 16MB	[8]/16/24/40
	<= 70ns	70ns
Video	>= 10" screen	see below
	dual-scan color	10.3"
	active-matrix color	9.5"
	>= 1MB VRAM	1MB
	ext. SVGA port	1280x1024
	OS/2 SVGA driver	N
	(detachable LCD)	N
Storage	>= 200MB	258/340/540/720/810
	acc. time as low as possible	~12ms
	xfr. rate as high as possible	8.3MB/sec
	internal floppy	Y
Power	battery: >3-4 hrs.	1 hr.
	hot swap	N
	OS/2 intelligent power mgmt	N (no APM)
	resume mode	N
	universal AC (built-in)	Y (N)

Table 1: Cypress 3600 vs. OS/2 Requirements

Given its touted reduced memory consumption and enhanced portability, I installed Warp and played a bit with it on a Cypress 3600 Pentium laptop. The second column in Table 1 shows how it fares on the OS/2 requirements.

If Warp is your first foray into OS/2, the just-released Warp for Windows installs over DOS/Windows. If you don't use Windows, but want to be able to run Windows applications under OS/2 anyway, you must wait for the "full" Warp version that comes with its own Windows emulator, WIN-OS2, expected in 1995.

In either case you can take advantage of Warp's new Easy Installation option if and only if:

- you want OS/2 installed on drive C: (I don't)
- you don't want HPFS support (I do)
- you want Boot Manager installed (I do)
- you don't have Windows installed (I don't)
- you want all OS/2 features installed (I don't)

Then, if Warp identifies and supports your hardware configuration, the installation is effectively a one-key step. Otherwise, you must use the Advanced installation.

Warp comes with more built-in hardware drivers than OS/2 2.x but, depending on your specific configuration, you may still run into problems. For example, like its predecessor, Warp does not install on the

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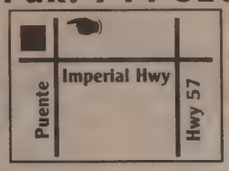

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If you are upgrading to Warp from a previous version of OS/2, you will want to preserve your customization, as it is tedious and wasteful to manually recreate it (hardware, session settings, applications, desktop). To that end you must opt for the same "type" of Warp as your older OS/2 version, but by preserving customization you may forfeit some of the Warp improvements. For example, I have OS/2 2.11 with WIN-OS2 version, so I must wait for the equivalent Warp version. I replaced standard folder icons with more descriptive ones, but after the upgrade they will not open, like Warp's standard ones.

It is not clear yet whether customized setups can be restored after Warp installation from OS/2 2.x backups. Restores by Iomega Backup, reviewed in a previous column, seem to work, but the program does not have a Desktop backup option (MSR's version of the program, BackMaster, did not work). MultiMaint, which I described in the last column, has a Portable Desktop Backup feature which its author describes as follows:

The BonusPak cannot substitute for the dearth of native, efficient, OS/2-exploiting full-fledged applications in almost all important niches.

"A [regular] Desktop Backup is basically just zipping files, directories and the associated EAs... The Portable Backup is accomplished by doing somewhat the same thing, i.e. copying the INI files and EAs for the Desktop, but [its] heart is the *.WPS file which is built by creating an Agent WPS object and using that object to call a large number of different WPS methods for each of the objects on the Desktop. That way, each of the objects is seen through the eyes of WPS and the Restore can also be done the same way. Since the WPS interface is consistent across versions of OS/2 and independent of the type of video etc., this Backup can be used across versions and machines. In addition, because of the way the information is saved, the Portable Backup can be used to Restore pieces of the Desktop, rather than the whole thing."

I received the latest version, 3.3, too late to try for this column.

The Cypress Notebook 3600

At 11" x 10" x 2.3" and about 9lbs. with battery and AC adapter, the 3600 is a laptop rather than notebook. As with the 486 notebook I reviewed in a previous column, the

continued on page 69

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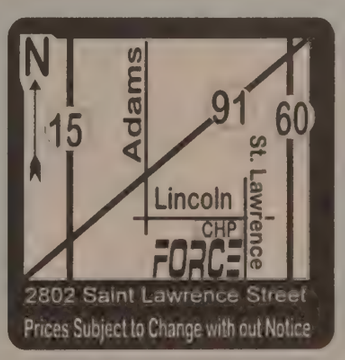

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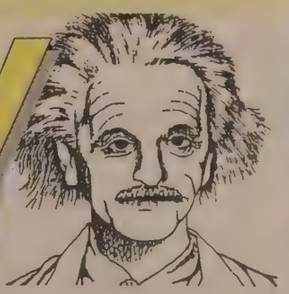

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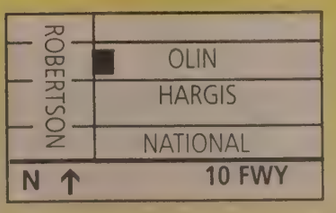

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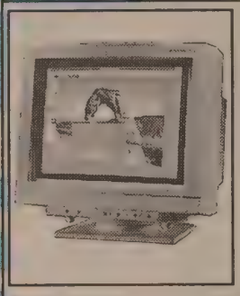

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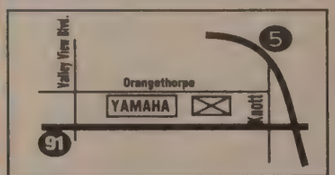

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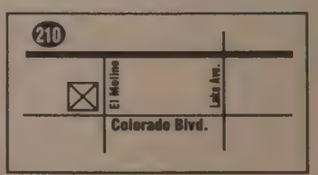

OS/2 *continued from page 64*

keyboard would benefit from some travel, click, and larger keys, but two collapsible legs provide at least some angle. The trackball is now more conveniently centered on the home keys, but I still believe that trackballs and other weird pointing devices should be replaced by cordless mice with integrated receivers. The PCMCIA slots are now on both sides of the machine, as some Type III cards are bulky and block the Type II slot if the slots are one on top of the other.

My unit had a 66MHz Pentium, 40MB of RAM, a 540MB hard disk, and a 10.3" dual-scan LCD color screen (recommended). The Advanced Installation was smooth. While Warp claims to run in as little as 4MB of RAM, I have not lowered the minimum memory requirement for OS/2, because multitasking DOS, Windows, and OS/2 applications—which is what OS/2 is all about—will need more, particularly since OS/2 native applications must yet become efficient.

The port for external monitors supports resolutions of up to 1280 x 1024, but the OS/2 video driver from Cirrus Logic, necessary for SVGA, is still the one for OS/2 2.0, which did not work even with 2.1. Performance was, as you can imagine, very good, but video performance could not be evaluated, because the video tests of the OS/2 benchmarking program crashed under Warp. The configurable Comet Cursor is nice, but for some strange reason it would not work unless I just accessed—without doing anything!—its Notebook of Settings first.

Warp supports Advanced Power Management, and it would benefit from its presence, as well as from a suspend—or resume—mode. But currently, notebooks support these features for DOS/Windows only. The 3600 comes with one metal hydride battery, which is not hot-swappable. I got about one hour's worth of continuous work out of the battery.

PCMCIA

PCMCIA support is more standardized than other hardware aspects. It, therefore, can serve perhaps better than anything else to illustrate the kind of hardware support problems that have plagued OS/2 since its inception.

Here is how PCMCIA is intended to work:

• Notebook manufacturers must provide, for every supported OS, Socket Services (SS), a device driver for accessing/interfacing with the machine's (vendor-specific) PCMCIA controller chip.

• Card manufacturers must provide a Client Device Driver (CDD), which knows how to identify and initialize specific cards.

• The OS must provide Card Services (CS), "an industry-standard interface layer between CDDs and the platform-specific CS," and a driver for allocating resources on behalf of CS.

But reality is different. IBM works with notebook makers to build OS/2 SS for their machines, but the fact is that only a handful, mostly major vendors, have participated in this endeavor. Cypress is in the vast majority of vendors who offer SS only for DOS and Windows.

In such cases an OS/2 SS driver for a machine based on the same chipset—here Cirrus Logic—might work, but that is basically a matter of luck. Warp's CS consists of two drivers, PCMCIA.SYS and VPCMCIA.SYS, and a Resource Manager. Like notebook manufacturers, many card makers do not provide OS/2 CDDs either, and this is true for the Megahertz XJ2144 fax modem card I have. A README file states as follows:

INSTALLATION INSTRUCTIONS FOR MEGAHERTZ PCMCIA MODEMS
Megahertz Corporation INSTALL V1.2B
January 26, 1994

This document describes how to install Megahertz PCMCIA modems for a variety of environments.
*** If your laptop is an IBM ThinkPad and you are running the OS/2 2.1 operating system, refer to section 1.*
*** If your laptop is NOT an IBM ThinkPad and you are running the OS/2 2.1 operating system, refer to section 2.*

Unfortunately, here's section 2:

SECTION 2: OS/2 2.1 On Non-IBM Laptops

At this time, the Socket Service drivers which are required for OS/2 2.1 PCMCIA support are available only from IBM and are supplied only with IBM ThinkPad computers. However, IBM is working with leading laptop manufacturers to make OS/2 2.1 Socket Services available on non-ThinkPad laptops. When this happens, the instructions above in section 1 should work for non-ThinkPads as well as ThinkPads.

Please contact your laptop manufacturer for information about availability of PCMCIA Socket Services under OS/2 2.1 for your laptop.

To resolve such problems, IBM has equipped Warp with a Super Client Device Driver for PCMCIA cards, "capable of recognizing most PCMCIA modems." For a compatible PCMCIA configuration, Warp can automatically install the PCMCIA drivers and Plug & Play, IBM's "OS/2 [PM] application (also known as Play at Will, EZPLAY, or Configuration Manager) that displays PC card information, socket status, assigned resources and card type."

The OS/2 installation program lists the machines for which SS drivers are provided and prompts you to select one. Based on the beta version of the PCMCIA drivers that I used for my previous Cypress review, I knew that three of the listed notebooks—Panasonic/Matsushita, Compaq Concerto, and NEC Versa E—were based on the Cirrus Logic chipset, and thus their SS had a chance of working.

But neither did. With the Compaq SS, Plug & Play would not even recognize the Megahertz XJ2144 fax modem inserted in the socket; with the two other drivers it would show the slots, and the modem as "Ready," but three communication programs refused to even dial.

No-Man's Land

IBM investigated the matter and sent some documentation that listed three other Megahertz modems supported by OS/2, but not the XJ2144. They stated that "older

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Megahertz modems" are not supported, but the XJ2144 is actually newer than the three listed.

Megahertz's reaction was:

Megahertz does not provide any PCMCIA drivers for OS/2 at all. The "Play at Will" drivers provided by IBM do however provide support under OS/2 for most PCMCIA controllers. I do not know what drivers you are using or what drivers you have attempted but would like to recommend you try the following:

1) OS2PCM.ZIP (available from the IBM BBS) is BETA Play at Will drivers. You should try this first.

2) UTTPS.EXE is the latest ThinkPad Utility disk and contains the very latest (released in past several weeks) IBM drivers for ThinkPad. It is version 2.0 I believe.

But 1) is what I used in my previous Cypress review, and it did not work even with OS/2 2.x; besides, the Warp drivers are more recent than the beta. As to 2), there is no reason to expect that a ThinkPad SS would fare any better with the Cypress than SS drivers for the same chipset and, given IBM's official "no support" policy, I saw no point in downloading the UTTPS.EXE large, and thus expensive, file.

I've installed Warp on my desktop and have quite a few things to report. Stay tuned; but in the meantime, users of OS/2 2.1x should keep it running in parallel until they make sure everything works under Warp. (My thanks to Cypress Computer, IBM's OS/2 Media Support, and Larry Martin, the developer of MultiMaint, for their help with this article.)■

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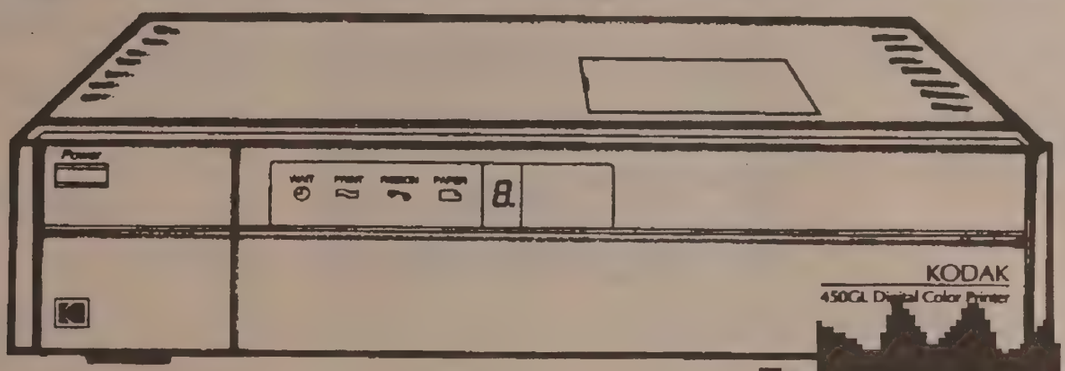

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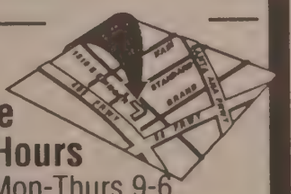

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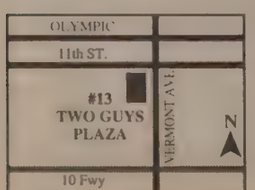

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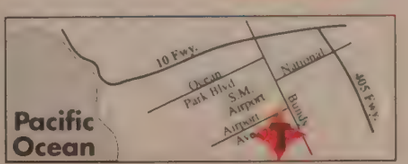

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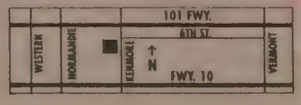

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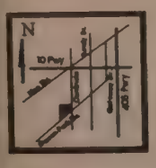

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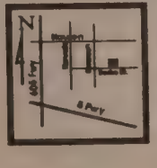

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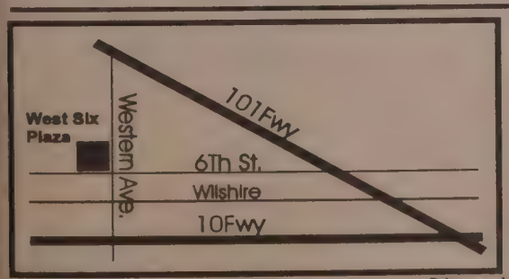

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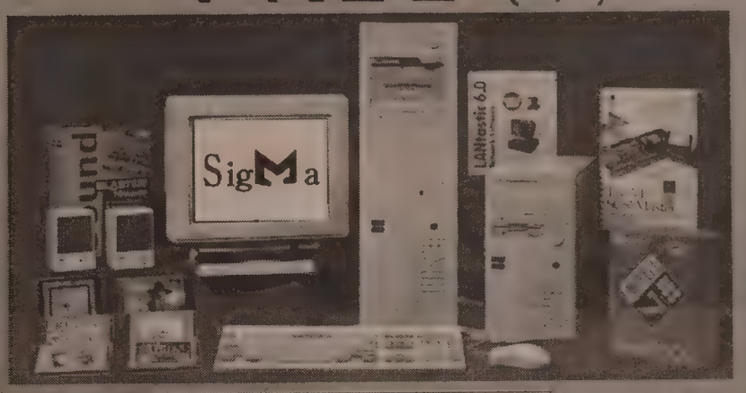

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Addressing

the lunch crowd at the recent PC Outlook conference, AMD's Jerry Sanders allowed as how he was having a little trouble with the transition from *enfant terrible* to *eminence grise.*

Compared to the adjustments some of his colleagues had to make in 1994, this was a pretty benign problem.

On the positive side, some real breakthroughs took place in 1994, after years of what amounted to incremental improvements of existing technology. Mosaic and then Netscape took the world by storm as computer users everywhere got Web fever, launching a communications and publishing revolution not seen since the advent of the laser printer. Meanwhile, Mac pioneers Bill Atkinson and Andy Hertzfeld unveiled General Magic's new technology, which may well live up to its promise of creating a personal communicator useful to real humans.

On the other hand, paralleling the lackluster performance of the Newton, the PDA market not only failed to take off, many once-hopeful startups crashed and burned.

Meanwhile, applications vendors were rapidly deciding that it was impossible to compete with Microsoft. Borland was in the doldrums. Quarterdeck's future was uncertain after the departure of its founders. DEC, IBM, and Lotus, among others, were struggling with self-reinvention.

1994 saw a major epidemic of acquisition fever—Novell bought WordPerfect to augment its previous acquisitions of UNIX and Digital Research, and at year-end Lotus was reportedly being courted by both Oracle and AT&T. Microsoft, meanwhile, did some empire-building of its own by announcing plans to acquire Intuit.

More than anything else, 1994 was the year in which the industry discovered that people's need to communicate with each other was a great business opportunity. Consequently there was explosive growth in the areas of wireless communication, online services, and everything Internet.

We hope you enjoy checking out the names and faces of this year's 100, and that you're on the lookout for next year's.

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MicroTimes 100

Man of the Year:

Marc Andreessen

Netscape

For years the industry's been waiting for the next "killer application." In 1994, as the whole world caught Web fever, Andreessen's work with Mosaic and then Netscape drove computer-based publishing and communications to whole new frontiers. (See accompanying interview.)

Sheldon Adelson

The Interface Group

Chairman and CEO

Adelson's flagship show COMDEX once again threatened to overwhelm Las Vegas this year, and continued its global expansion. Despite wails from nearly all constituencies in the industry that COMDEX is too big (and occasional attempts to capitalize on this notion by hopeful show promoters), the industry gathering-of-gatherings shows no sign of losing momentum.

Will Adelson's longtime interest in the gambling industry (he owns the Sands Hotel, among other primo Vegas properties, and lobbies in favor of gambling in Israel) converge with the emerging development of online transactions? We'll see...

Beny Alagem

Packard Bell Electronics

Chairman, President, and CEO

Less than a decade ago, entrepreneur Alagem purchased the rights to the Packard Bell name from Teledyne and went into the computer business, perceiving an opportunity in high-volume retail sales.

While the highly competitive mass market has been a bloodbath for other vendors, Packard Bell has established itself as the market leader in the US for that channel, now accounting for over 43% of sales. Specializing in plug-and-play systems configured especially for the first-time user, the company's kept a finger firmly on the pulse of the consumer market and adapts quickly to its changing demands.

Robert Allen

AT&T

Chairman and CEO

Allen has made some bold moves to focus AT&T's efforts and launch it into the next century, from the acquisition of McCaw Cellular to a variety of video-on-demand and other pilot projects. He's streamlined operations and is well on the way to making the aging giant a lean, mean info-services competitor in a global marketplace.

Paul Allen

Investor

Allen, who co founded Microsoft with Bill Gates and still holds significant amount of stock in the company, found himself in the headlines over his attempts to acquire a controlling interest in America Online, an effort he officially abandoned in 1994.

Nonetheless, Allen's been acquiring and founding companies that position him as a leading force in most of the interesting areas of emerging technology—his holdings range from Interval Research to TicketMaster. As the owner of the Portland Trail Blazers as well, he's also got a nice little niche carved out as an NBA-licensed content provider...

Efi Arazi

Electronics for Imaging

CEO

Arazi was an early believer that the demand for color graphics constituted a business opportunity, and today his technology is a mainstay of color-intensive environments from corporations to ad agencies. On the hardware end, the Fiery server converts color laser copiers to work as high-speed PostScript printers; the EfiColor color management software and other tools offer precision control to graphics professionals.

Marc Asch

Minnesota House of Representatives

Asch says, "I am the father of the Minnesota House gopher which was the first legislative gopher on the Net, and we think still the best."

Opposing Clipper was very popular during 1994, but in Minnesota, where the health insurance business is big and the concern for privacy of medical records heartfelt, Asch made a compelling case to his fellow legislators that the federally favored Clipper wasn't nearly strong enough for them.

The result was an amendment (in italics) to the state's statutes governing the administration of its health care program:

"Encryption must follow encryption standards set by the national bureau of standards and approved by the American National Standards Institute as ANSIX3. 92-1982/R 1987 to protect the confidentiality of the data. Social security numbers must not

be maintained in unencrypted form in the database, and the data must never be released in a form that would allow for the identification of individuals. *The encryption algorithm and hardware used must not use Clipper Chip technology.*"

Bill Atkinson
Chief Scientist

Andy Hertzfeld
Software Wizard,
Senior Vice President
General Magic

While it's perhaps true that the other Bill 'n' Andy got more headlines during 1994, these much-revered members of the original Macintosh team certainly got more unadulterated affection. They had a triumphant return of sorts as they unveiled their Telescript and Magic Cap technology to an adoring SRO crowd at Macworld in January, on the tenth anniversary of the Macintosh itself.

The first device incorporating the technology, the Sony Magic Link, shipped in the fall of 1994; expected early this year is Motorola's Envoy, the first wireless product, which will more fully exploit its features. At the convergence of personal assistants and online transactions, General Magic has a host of strategic investors and technology partners and could be one of the key players as a new dimension in mobile computing takes shape.

Carol Bartz
Autodesk
Chairman, President, and CEO

During 1994, Autodesk passed IBM as the world's largest producer of CAD-related software. Pleasing both the company's technically demanding customers and Wall Street, former Sun VP Bartz strengthened Autodesk's position both in its traditional CAD market (which saw the shipment of AutoCAD Release 13) and the explosively growing multimedia arena, where 3D Studio has prospects of becoming a similar standard.

As the leading vendor of tools for creating both real and virtual stuff, Autodesk's potential in the next few decades is obvious; Bartz's ability to get the best from her various constituencies, from programmers to customers to financial analysts, makes it all seem highly likely to be realized.

Daniel Ben-Horin
CompuMentor
Director

Paralleling the growth of many a Silicon Valley startup, Ben-Horin has built CompuMentor from a small ad-hoc volunteer organization to a significant presence in the local nonprofit world, which it serves with a variety of computer support. 1994 also saw the expansion of the organization's efforts to the K-12 world, helping teachers and students realize the benefits of technology.

Dennis Bennie
Delrina
Chairman and CEO

Cofounder Bennie has built Delrina to a position of supremacy in the booming PC fax marketplace, offering easy-to-use products that critics and consumers swear *by* instead of *at*.

This core business was augmented by Delrina's foray into the screen saver market, where it achieved instant notoriety with a portrayal of Bill and Opus shooting down the competition's flying toasters. Happily, after a war of words among Delrina, Berkeley Systems, cartoonist Berke Breathed, and hundreds of impassioned kibitzers on the Net—with scenic forays into Jefferson Airplane cover art—yet another look 'n' feel lawsuit was averted.

Charles W. Berger
Radius
Chairman and CEO

After a year that included the acquisition of longtime crosstown rival SuperMac, Berger has Radius positioned to take long-term advantage of the growing demand for multimedia. The company's products, from monitors to accelerator boards, are a mainstay of both professional and consumer systems, especially on the Macintosh platform, where PowerMac upgrades are an attractive new business.

Tim Berners-Lee
World Wide Web Creator

Berners-Lee developed his first hypertext system, Enquire, in 1980, for his own use. In 1989, while working at CERN, the European Particle Physics Laboratory, he created the World Wide Web, "an Internet-based hypermedia initiative for global information sharing." The initial prototype was developed on the NeXT. In March 1993, when NCSA Mosaic was first released, WWW traffic on the Internet measured 0.1%. Six months later it measured 1%, and has continued to grow exponentially. To address the soaring international need, a CERN-MIT agreement formed the W3 Consortium in July 1994. Berners-Lee coordinates WWW development from the W3C US office in the Laboratory for Computer Science at MIT (MIT/LCS).

Jim Bidzos
RSA Data Security
President

The outspoken Bidzos, whose company's secure encryption products are a key component of communications products from Lotus Notes to General Magic's Telescript, was much in the press during 1994, darkly hinting of FBI threats against his person and often objecting loudly to the federal government's proposed and notoriously insecure Clipper standard. The Clipper hazard was at least partially averted, but not before Bidzos had sent out large quantities of ominous SINK CLIPPER posters, destined to become collector's items.

BMUG

An international force for good, BMUG established a new presence in cyberspace with a forum on Apple's eWorld, providing thousands of Macintosh users with quick and easy access to resources from tech support to shareware. The organization also hosted numerous noteworthy events during the year of the Mac's tenth anniversary, not least of which was a stellar presentation by Mac demigods Bill Atkinson and Andy Hertzfeld of their new work with General Magic.

Jeff Braun
Chairman and CEO

Will Wright
Chief Software Designer
Maxis
Cofounders

The vision that began with SimCity has brought forth a veritable Sim-Mania, as do-it-yourself alternate universes from Planet Earth to ant colonies emanate from Maxis's Orinda headquarters to an eager audience. The Sim products, recently joined by the blockbuster SimCity 2000, have garnered awards from trade, gaming, and educational organizations alike. Maxis products, which also include the program-your-own-fish-DNA aquarium El-

Fish, manage to be both complex and engaging, and are finding favor with consumers from power users to children.

Kaye Caldwell

Software Entrepreneurs' Forum
President

We'd like to thank frequent denizen of this list Barbara Cass, executive director of SEF, for bringing Caldwell to our attention. Says Cass: "For several years, Kaye has served as our link to what is going on in both state and federal legislative arenas. She is currently also serving as president of the Computer Software Industry Association and is policy project director of the Software Industry Coalition. She served on the program committee for the 5th Computers, Freedom & Privacy conference. She has participated in the International Intellectual Property Study Group, and also has been appointed to the legislative committee for the Council of Regional Information Technology Associations."

So a hearty round of applause to Caldwell for her hard work in all of these areas crucial to a developing software industry. And a few cheers as well to Cass and her intrepid crew at SEF.

Maria Cantwell

Congressional Representative
D-WA

Armed with hundreds of email and fax messages from concerned computer users and high-tech businesses, first-time representative Cantwell initiated legislation in Congress that would have removed government restrictions on the export of secure cryptography, an issue that affects such products as Lotus Notes and System 7 Pro.

It was a fine effort in electronic democracy. Alas, it achieved little except to garner Cantwell an astonishingly patronizing letter from Vice President Gore.

Cantwell was defeated in the November elections.

Meanwhile, individuals concerned about the issue continued to disseminate copies of Phil Zimmermann's free program Pretty Good Privacy (PGP), and large corporations considered the advantages of evading export controls by hiring newly unemployed Russian crypto wizards offshore.

Doug Carlston

Brøderbund
Chairman and CEO

Early in 1994, Carlston abruptly dropped plans for a merger with Electronic Arts, thereby bucking a general converge-o-mania that characterized the software business during the year. It turned out to be a good move, as Brøderbund became one of the darlings of the edutainment boom, from the elusive yet ubiquitous Carmen Sandiego, who's attained classic status and gone CD-ROM, to book-based preschool titles. However, the company's most noteworthy achievement during the year was the perpetration of Myst, which, depending on how you look at it, is either an incredibly complex and beautifully designed virtual world or the biggest drain on the technology industry's productivity since the Internet worm.

Denise Caruso

Analyst

Despite the demise of the short-lived *Technology & Media* newsletter for which she'd left *Digital Media and Seybold*, Caruso is much in evidence as one of the more clear-thinking and hype-immune analysts of the multimedia scene. She's been known to bring highly imaginative panel discussions to a screeching halt by inquiring just what is going to cause real people to spend their hard-earned bucks for the hypothetical technology in question, a question that needs to be asked early and often these days.

Steve Case

America Online
President

Case was just unstoppable this year, as AOL continually launched new services, improved its software, passed the million-user mark, avoided being acquired by Paul Allen, and generally closed in aggressively on longtime leader CompuServe and populous-but-troubled Prodigy. At year's end, the stock split 2-1 yet again, the company announced increased participation in cable-based pilot projects, and Case staked out major turf on the info highway with the acquisition of several companies including Internet backbone architects ANS.

Vinton Cerf

The Internet Society
President
MCI
Senior VP for Data Architecture

Often called "The Father of the Internet," Cerf's career is closely intertwined with its evolution. As a graduate student at UCLA in the 1960s, he worked on the design and implementation of host communication protocols for the first Interface Message Processor (IMP), which in September 1969 became the first node of the ARPAnet. In 1972 he coinvented TCP/IP with Robert Hahn. He interrupted his research to serve as chief engineer of MCI Mail from 1982–1986, and has recently returned to MCI to oversee design and development of the network architecture to support MCI's future Net services.

In a recent interview in *Wired* with Steve Cisler, he said of the ARPA/Internet, "it was supposed to be a highly robust technology for supporting military command and control... Along the way, it became a more research-support infrastructure, and now has become the best example of global information infrastructure that we have."

Ronald Chwang

Acer America
President and COO

Currently wholly owned by parent company The Acer Group in Taiwan, Acer America is expected to have its first public stock offering in the US in the near future as part of Acer's "global brand name, local touch" strategy. Chwang has brought the company to a position of strength and leadership in its own right, as its revenues nearly doubled over the previous year, its local production (which supplies a significant percentage of Acer's exports) exceeded 50,000 units per month, and the company, for the first time, broke into the ranks of top-ten computer suppliers in the US.

In both Latin America and Southeast Asia, however, Acer's #1, so Chwang's got his work cut out for him.

Steve Cisler

Apple Computer
Librarian

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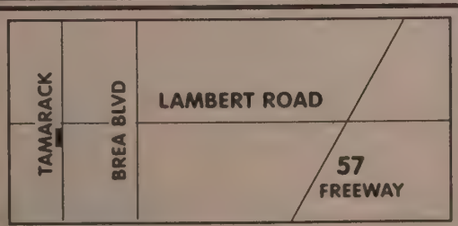

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fields of libraries and community networking, Cisler has become one of the industry's leading figures in the quest for human-friendly technology that adapts to local needs. Among his many responsibilities is running Apple's Library of Tomorrow grant program.

"The Ties That Bind," a landmark conference held in May as a result of Cisler's efforts, brought together hundreds of sysops, government agency types, entrepreneurs, and others to explore what was and wasn't working, from the Santa Monica PEN system to educational Mac-based virtual villages in South America. Much catalyzing and idea-sharing resulted, to the benefit of all.

Jim Clark
Netscape
Chairman

After over a decade as the chairman and visionary of Silicon Graphics, Clark moved on to Netscape (originally Mosaic Communications), a new venture that almost immeforces with Marc Andreessen and most of the original NCSA Mosaic development team, Clark's planning to deliver the technology to enable secure commercial transactions, from home shopping to stock trading to publishing, over the Internet. Over a million users have downloaded the client software; with the Bank of America one of the first to announce a service based on Netscape's technology, acceptance on the server side seems assured.

Scott Cook
Intuit
Chairman

One of the few who managed to beat Bill Gates at his own game as Quicken regularly trounced Microsoft Money, Cook built Intuit into the undisputed ruler of the PC-based financial world. It was therefore something of a surprise when he and Gates agreed to a highly amicable acquisition of Intuit by Microsoft. Cook, who will remain with the company, is expected to be instrumental in Microsoft's entry into the world of online transactions.

William Davidow
Mohr Davidow Ventures
General Partner

In view of how well it predicted many of the year's industry trends, we'd like to give yet another salute to the book Davidow coauthored with Michael Malone, *The Virtual Corporation*. It's been out for a couple of years now, and probably did more than any other contemporary work to galvanize the business world around leanness, meanness, just-in-time everything, and continual self-reinvention. It was a testimonial to the book's effectiveness that on a recent episode of *60 Minutes*, multimedia entrepreneur Mick Jagger explained at considerable and accurate length the ways in which the current Rolling Stones world tour is a perfect example of a virtual corporation.

Jan Davidson
President and Founder

Robert Davidson
Chairman and CEO
Davidson & Associates

The Davidsons built on their longtime success in the education market to become even bigger in edutainment. With everything from math tutorials to kid-level multimedia authoring systems, Davidson had a banner year in 1994.

Marilyn Davis
Frontier Systems
Proprietor

Reader Ann Scheurell recommends Davis to our attention for her work in a relatively uncharted area of electronic democracy, developing eVote software at her own expense. This UNIX-based program allows secure voting and tallying on networks and conferencing systems.

Says Scheurell, "Dr. Davis and a growing number of people believe that if we were to use the Internet to exercise a people's form of discussion-driven democracy, we could actually make our government work again. eVote embeds into conferencing systems to support discussion-driven democracy—for community networks, and anywhere else consensus building provides answers. A developer's kit and software are available today, while Davis keeps safe the source code for the central 'Clerk' until the online community votes to take responsibility for it. eVote is a gift for a democratic world."

Sky Dayton
EarthLink Network
CEO

"A young entrepreneur with a community-based desire to serve," says the reader who brought Dayton to our attention. Convinced that you shouldn't have to be a UNIX weenie to enjoy the benefits of the Internet, Dayton launched EarthLink, a user- and wallet-friendly Internet service provider, in Los Angeles in the summer of 1994, and the system is currently one of the fastest-growing in the country.

Bart Decrem
Plugged In
Director

Decrem has done a lot of good in the community of East Palo Alto, giving local kids both vital skills and a boost in self-esteem with this innovative multimedia-oriented learning program. With determination, ingenuity, dedicated volunteers, and lots of support from computer corporations in the area, Decrem and Plugged In have developed widely acclaimed learning activities that are inspiring imitation in other areas.

John Doerr
Kleiner Perkins Caufield and Byers
Partner

One of the venture capital industry's most technically knowledgeable representatives, Doerr is a leading force in emerging communications markets. While remaining an interested observer of such long-term endeavors as nanotechnology, he's currently focused on areas like education, wireless, and connectivity.

Dixon Doll
DMW Group
Chairman

As a consultant and a venture capitalist since the late

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1970s, Doll was one of the first to recognize and develop the potential of the emerging communications market. With Accel Partners, where he was a partner until late 1994, he was instrumental in the funding and growth of such networking successes as Network Equipment Technologies, Racotek, Bridge Communications, Alantec, Optilink, and Vitalink Communications. He continues to strongly influence the evolution of these technologies, particularly as they interface with the emerging Internet and information services.

Brian Dougherty

Geoworks

Chairman

Despite the failure of the PDA market to reach epic proportions, which swept many hopeful companies away in a deluge of red ink, Dougherty has managed to succeed in this niche. With ever-smaller and more efficient versions of the GEOS operating system, which runs on a variety of hand-held devices including Casio/Tandy Zoomers and Sharp's PT-9000, he's taken advantage of Microsoft's delays with WinPad and consolidated market share, building alliances and winning investment from such heavyweights as Novell and Hewlett-Packard. He's also established a presence in the portable-connectivity market with versions of the America Online and CompuServe software for hand-held computers.

John C. Dvorak

Author

Long before multimedia was a household word, Dvorak was a multimedia kind of guy—radio, books, magazine columns, you name it. He's the focus of the biggest love-hate relationship in computer journalism, with few readers neutral on the subject. He's rumored to be strategizing for expansion onto the Info Superhighway, with the Dvorak Channel said to be at the early-concept stage and seeking investment.

Heroes Of The Net

Reader David Newman writes in appreciation of the myriad and often unknown collaborators who bring us the benefits of the Internet:

"I nominate the Web and its creators—and Mosaic; the whole family tree, so it would be Tim Berners-Lee and CERN for the Web, and Marc Andreessen and his buddies at NCSA/UIUC, then Jim Clark, and the Mosaic licensees like Spry/ORA and the others; and Mosaic Communications (now Netscape), and even Mozilla, their mascot, who has earned a spot on your cover. [*Well, Mozilla's not on the cover, but will you settle for Andreessen? —eds.*]

"It would be like a virtual company portrait; those who absolutely, completely, and irrevocably transformed the Internet into something that could be used by anyone; it provided a cartoon-like, stunningly easy-to-use interface onto an untold number of Web, FTP, and other server resources at an untold number of sites; creating singlehandedly the whole embryonic but quickly growing Web industry.

"Alongside, I would nominate all of the people who offer shareware and freeware to the Net in the form of enlightened self-interest: the creators of Eudora; Steve Dorner; John Norstad for NewsWatcher; the creators of Gopher, Anarchie; especially Cornell University's CU-SeeMe video conferencing software; Richard Cogger... you get the idea.

"These are the Johnny Appleseeds of the Net, planting seeds of trees that are gonna grow well beyond our little lifetimes."

Esther Dyson

Release 1.0, RelEAST

Having delegated the editorial responsibilities for *Release 1.0* to Jerry Michalski, Dyson is heavily involved in efforts to create mutually beneficial connections between the Eastern European techs and the US computer industry. She's a notable catalyst, serving on numerous boards and holding the annual PC Forum at which movers, shakers, and hopefuls congregate to get things done.

Larry Ellison

Oracle

President and CEO

Now that he's addressed Oracle's problems of a few years back and once again firmly entrenched it as the Lion King of the relational database world, Ellison has gone after the interactive video market, launching several collaborative projects with assorted telcos and computer companies around the world. He's also a strong booster of massively parallel computation, a technology that's somewhat out of favor at the moment but which he thinks ultimately will provide an unbeatable edge in both the RDMS and multimedia markets.

1994 Year In Review

Robert Frankenburg
Novell
Chairman, President, and CEO

Recruited from Hewlett-Packard, where he dramatically improved the performance of its networking division, Frankenburg replaces revered chairman/CEO Ray Noorda, who retired in 1994. He faces some formidable challenges, the most visible of which is Microsoft's direct aim at the network business.

Arriving shortly after Novell acquired WordPerfect, Frankenburg also faces the task of defining and coordinating the operations of the company's very different but interdependent businesses: applications, networking, and UNIX. However, Frankenburg seems well qualified to achieve this and advance Novell in a rapidly changing and growing market.

Louis Freeh
Federal Bureau of Investigation
Director

One of the year's unambiguous winners, Freeh combined political savvy with raw determination to achieve the passage of the Digital Telephony bill, which requires telephone service providers, under penalty of heavy fines, to make their equipment wiretap-ready.

In the shock waves that followed President Clinton's signing of the bill into law on October 22, privacy enthusiasts redoubled their pursuit of better encryption software. Freeh, meanwhile, went on record as saying that if Digital Telephony wiretaps delivered only encrypted "garbage," he'd probably seek legislation restricting the private use of cryptography as well.

David, John, and Randy Fry
Fry's Electronics

They were considerably ahead of the curve on the current trend to combine technology and consumer goods, and the Fry Bros.' unique retail concept has enabled them to stay ahead of the competition. They've withstood the onslaught of CompUSA in fine style and are now confident in the face of a new invasion from Minnesota's Best Buy.

Chris Galvin
Motorola
COO and President

Grandson of the company's founder, Galvin is currently leading Motorola's efforts in the wireless communications market. One strong interest is Iridium, a consortium in which Motorola is a major shareholder, which plans to build a global satellite network for a full range of mobile voice and data services.

On another front entirely, 1994 saw the successful debut of a host of machines based on Motorola's PowerPC CPU, intended to offer a RISC-based platform to compete with Intel's technology.

Bill Gates
Microsoft
Chairman

Gates had quite a year: acquiring Leonardo's notebook, topping the *Forbes* 400 list of wealthy individuals in the US, emerging unscathed from the FTC's antitrust investigation, and handily retaining Microsoft's domination of the operating systems market despite the delayed advent of Windows 95.

Not resting on any laurels, however, Gates was on the lookout for new endeavors for Microsoft. One of his most noteworthy accomplishments in this regard was the acquistion of Intuit, the financial software company that enjoyed the rare status of competing successfully with Microsoft. Intuit, in combination with Microsoft's announced Marvel online service, stands to put Microsoft in an excellent position as a provider of home banking and other financial transactions.

Louis Gerstner
IBM
Chairman and CEO

Gerstner's ongoing cost-cutting and structure changes have succeeded in making Big Blue a lot leaner and meaner. While far from out of the woods, the company's got cause for rejoicing—the ThinkPad notebook computers are a hit, the PowerPC machines show good promise, and OS/2 has continued to gain market share in the absence of Windows 95. After a year and a half of running IBM, Gerstner has halted the torrents of red ink and restored the giant to the verge of profitability.

George Gilder
Author

In his books *Microcosm*, *Life After Television*, and the forthcoming *Telecosm*, as well as his columns in *Forbes*, Gilder explains his vision of an emerging and extremely interconnected world—and where its opportunities lie. An outspoken conservative, he was much in the headlines during 1994, challenging FCC Chairman Reed Hundt's radio spectrum auction on the grounds that technology made bandwidth scarcity a non-issue.

Jock Gill
White House
Aide

Gill has long been a prime mover in getting the executive branch onto the info highway, and it's thanks to much of his work that now anybody with an Internet connection can send virtual bouquets or brickbats to president@whitehouse.gov—indeed, Web travelers can now set the controls for http://www.whitehouse.gov and get a multimedia tour of the White House.

William Gross
Knowledge Adventure
President and CEO

Recognizing that there's more to educational multimedia than recycled versions of text, Gross has pioneered a highly interactive approach to fun and learning. His young company has already garnered numerous awards for such products as Dinosaur Adventure and Space Adventure, and entered into alliances with AT&T and Steven Spielberg.

Andy Grove
Intel
CEO and President

While the Pentium's floating-point bug was a major topic of heated discussion at year's end, it seemed to do little to weaken Intel's supremacy in the CPU marketplace. Nor, at least according to Grove's own comments, were the incursions of upstarts AMD, Cyrix, and others causing much of a problem.

Far from complacent, however, Grove aggressively pushed Intel into a variety of other ventures, perhaps the most visible of which was a network-based news-on-demand collaboration with CNN.

Jeff Hawkins
Chairman

Donna Dubinsky
President and CEO
Palm Computing

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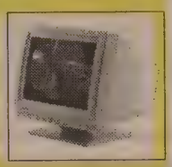

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Team OS/2: The Salmon-Shirted Ninjas Of COMDEX

Reader Carl Camera writes:

"I nominate 'Team OS/2.'

"Who's Team OS/2? Mostly non-IBMers who volunteer their own time and money promoting OS/2 to friends, family, strangers! There's no entrance fee—no meetings—no secret handshake. Just folks who promote OS/2 as a viable PC platform.

"I am an IBM employee, but I'm the exception in Team OS/2. Most Teamers are not IBM employees.

"IBM publishes a monthly newsletter (distributed on CompuServe) where Teamers report on product demos and exchange hints and tips with each other. There are more than a few Team OS/2 members outside the US, reaching as far as Russia and Australia, Singapore and Denmark. What ties us together is OS/2."

Camera forwards this COMDEX report from Teamer Keith Wood:

"This is the fifth COMDEX to be visited by Team OS/2 members in their distinctive shirts ('Don't call them pink—they're *Salmon*!'), and their enthusiasm has increased with every show. Teamers have been covering the convention sites supporting exhibitors who are interested in running OS/2 in their booths.

"Though there is no money in this, Teamers' experiences are worth millions—for instance, Teamer Dick Krueger was standing behind the crowd at the Warp demo booth when he discovered that he was next to none other than Bill Gates! The MS head was concentrating on the demo, and left before Dick had a chance to offer to help Bill get Warped!"

The well-balanced management team of Hawkins (the leading force behind GRiD's pen-based products) and Dubinsky, a veteran of high-level management at Apple and Claris, has been instrumental in ensuring that the fledgling Palm has not been one of the casualties of the often-disappointing PDA market. By finding successful niches in the PDA market (including PC connectivity and the innovative and hotly debated Graffiti, which, as they point out, is *not* handwriting recognition), they're keeping the company healthy while continuing development for the bigger things that lie ahead in mobile computing.

Dewayne Hendricks

Tetherless Access

President

"Dewayne," writes one of our readers, "has picked one of the hottest markets around and is up against the odds with the FCC trying to change the rules of the game in favor of big companies."

He's referring, of course, to the recently started auction of previously unlicensed frequencies of the radio spectrum, and the fact that Hendricks's company had built quite a nice product line, some of which takes advantage of this part of the spectrum. As a result, Tetherless was of great interest to community nets—for instance, rural communities seeking to use radio to bypass the high cost of phone service and access the Internet in an affordable fashion, with wireless technology merged with TCP/IP connectivity.

Hendricks appears unfazed by this development, however; he was active on the Net a good twenty years before it was fashionable and has the expertise to navigate its sometimes treacherous waters and build useful connections.

Mark B. Hoffman

Sybase

Chairman, President, and CEO

With the recent acquisition of tool-builder Powersoft, Hoffman's beefed up Sybase's strength on the client side of the client-server computing arena to complement the company's strength in server technology. The company continued to grow and prosper in 1994 on a number of fronts, and announced that it would be providing software for Scientific Atlanta's PowerTV set-top boxes.

Dave Hughes

Old Colorado City Communications

As the most visible spokesman for a distinctly populist brand of electronic democracy, Hughes has long been exploring the advantages of packet radio as a medium for low-cost telecommunications. He was predictably and vociferously incensed at the FCC's auction of previously unlicensed radio spectrum frequencies; however, the same determination that led him to hire Russian programmers to write custom software to be implemented in community networks in Latino and Native American towns in the Southwest will probably lead to some ingenious fix.

Reed Hundt

Federal Communications Commission

Chairman

Depending on who you listen to, the current radio spectrum auction over which Hundt is presiding will be either the making or the death of Access For The Rest Of Us, but after a year in office, Hundt is doing a creditable job of trying to balance the demands of his varying constituencies. The most formidable task facing him is creating a livable regulatory climate, as telcos, cablecos, online services, satellite providers, and others, with their attendant morass of conflicting rules and overlapping agencies, clamor for a level on-ramp to the info highway.

Steve Jobs

NeXT

Chairman

Confounding the prognosticators of doom, Jobs has not only managed to keep NeXT going in the aftermath of the wrenching decision to jettison the black workstations and focus on systems software, he's actually managed to find a pretty successful, if less glamorous, niche. Having won acceptance for NeXTstep not only in the Intel arena but with former arch-rival Sun, Jobs is benefiting from ongo-

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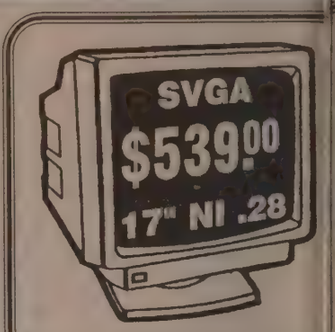

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Reese Jones
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Alan Lefkof
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Farallon Computing

BMUG cofounder Jones and GRiD veteran Lefkof have built the company's early advantage in Macintosh networking (where it continues to enjoy a market share of around 60%) into a formidable presence in networked computing. During 1994 they established a strong presence in the Ethernet world with EtherWave, an unprecedented plug-and-play 10BaseT link that's garnered many honors both on Mac and PC; additionally, they achieved significant acceptance for Replica, their document-sharing software that competes with Adobe Acrobat.

Brewster Kahle
Wide Area Information Servers, Inc.
President and Chief Technical Officer

Kahle is the inventor and architect of WAIS, Wide Area Information Servers, a remote search and retrieval resource for networks such as the Internet. Kahle sees computer networks pushing a quantum leap forward in communication, in which everyone can be both publisher and consumer of ideas and information.

Now at WAIS, Inc., which he cofounded after working at Thinking Machines, Kahle is developing ways to improve access and retrieval of published documents on the Net. WAIS, Inc.'s customers are as diverse as Net users, including the Government Printing Office, the World Bank, Sun Microsystems, Fujitsu, Dow Jones, and the Encyclopaedia Britannica.

Philippe Kahn
Borland International
Chairman, President, and CEO

It was a tough year for many of the software giants, and Borland was no exception. Always one of the industry's more colorful figures, Kahn was often downright subdued in 1994, though he managed to stymie a shareholder coup intended to remove him from office. The long-awaited Windows versions of dBASE and Paradox arrived just in time to plunge Borland into a ruinous pricing war in the cutthroat applications marketplace, and Kahn began the arduous process of what he called "reengineering Borland." Key emphasis of the new strategy is "upsizing," migrating customers from desktop databases to connectivity with larger client-server solutions. Borland envisions a new niche as the "Switzerland of tools" in the database market, as moves like Sybase's acquisition of Powersoft cause some customers to seek vendor-independent solutions.

Mitch Kapor
Chairman, Cofounder

John Perry Barlow
Cofounder, Member Board of Directors
Electronic Frontier Foundation

It's been kind of a tough year in Washington for the "odd couple of cyberspace" as the civil liberties organization hit the Congressional wall, achieving minor victories in Clipper legislation and drawing howls of anguished protest for its equally anguished decision to support the version of the Digital Telephony bill that eventually became law. However, given that massively diminished hope in Washington was a fairly recurrent theme during 1994, it remains to be seen whether EFF fares better or worse under the new Congressional order; one of the organizations' main strengths is its founders' fairly unique door-opening and networking abilities in diverse worlds, and in the current situation Barlow's status as a former county chairman for the Republican party couldn't hurt.

Roger Karraker
Santa Rosa Junior College
Instructor

Karraker's efforts to acquaint his journalism students with the world of online communications had a profound, if infelicitous, effect on BBSing in the schools. For stalwart service and determination to do the right thing in the face of severe adversity, he's the recipient of this year's grace under pressure award. With Oak Leaf clusters.

Robert Kavner
Creative Artists Agency
Business Affairs

A proponent of the importance of content during his successful sojourn at AT&T, Kavner still surprised many when he left the telco giant for showbiz. Bringing his expertise about the conduit side of the business to this top-flight talent agency, he's a key figure in facilitating the convergence of various industries which have operated under vastly divergent cultural and business models, and whose collaboration is vital for promising technology to become a viable business.

Kevin Kelly
Wired
Executive Editor

The tension between style and substance is part of the very DNA of *Wired*, where Marshall McLuhan is the patron saint and the medium is quite definitely a big part of the message.

Kelly is definitely one of the forces for substance. One of the computer world's more independent thinkers, he's also the author of *Out of Control*, a book in which he explores some of the deeper implications of the technology with which we're becoming interdependent.

Bruce Koon

Marcelo Rodriguez
San Francisco Free Press
Founders

San Francisco's newspaper strike catalyzed the rapid (and unexpectedly early) deployment of online publishing tools, at a time that coincided fortuitously with the release of Netscape's Web browser. In what's sure to figure as a pivotal moment in the history of publishing, Koon and Rodriguez set up a page on the World Wide Web in which print-deprived readers could access highly topical columns by striking writers newly freed from the constraints of column inches.

The resolution of the strike sent the Freep files to the archives before its possibilities as a commercial venture had been seriously explored, but the fact that it was accessed a quarter of a million times during its brief existence on CCnet suggests that there really is an audience for this sort of thing.

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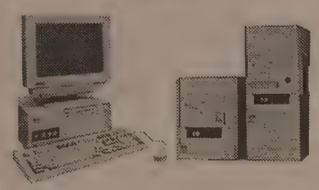

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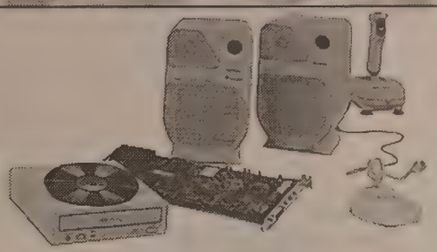

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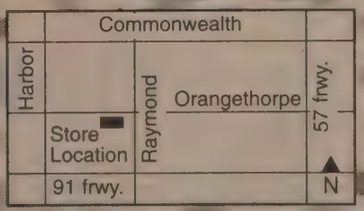

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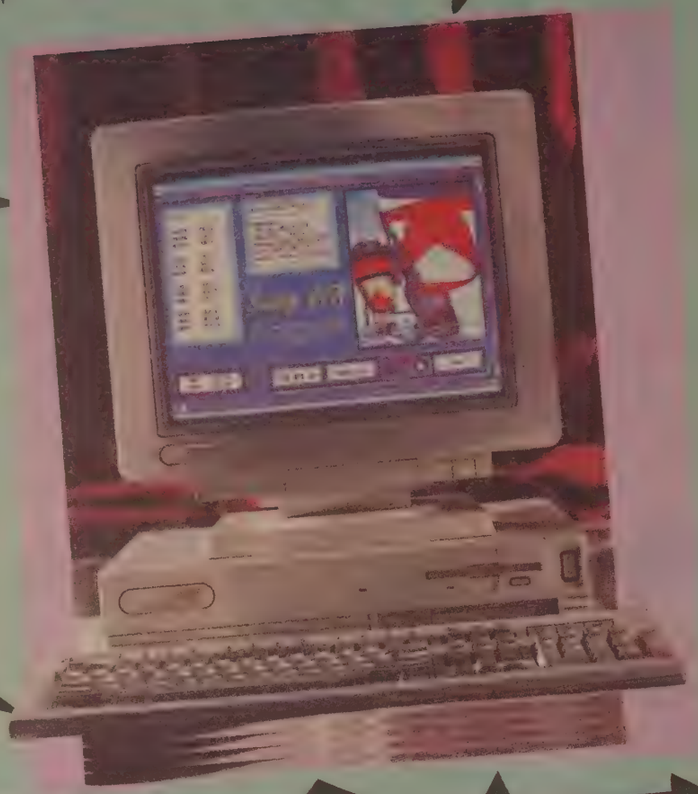

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1994 Year In Review

Bill Lockyer

State Senate, California President Pro Tem

Thanks to Lockyer's appreciation of the benefits of technology, all senators will henceforth have an IBM ThinkPad on their desks when they're in session, in order to be able to instantly access the text of bills under consideration, as well as supplemental materials. Aside from the benefits from better access to information, this paradigm shift is expected to save the taxpayers considerable printing costs as the computer system replaces tons of paper generated in the course of legislative business.

Gilman Louie

Spectrum Holobyte Chairman, Chief Technical Officer, and Strategic Development Officer

Louie's kept Spectrum in the forefront of the gaming world, as it successfully completed a merger with rival MicroProse to become the undisputed leader in the flight simulator arena. With Paramount as one of the company's chief investors, Spectrum was also planning a big holiday season as the exclusive licensee of a variety of Star Trek: The Next Generation and Generations products.

Tom Mandel

Philip Elmer-DeWitt

Forum Leaders TIME Online

Almost from the beginning of online services, magazines have been trying to figure out what to do with the medium. Most online versions of magazines have turned out to be pretty dismal, often consisting of recycled stories and the occasional email address.

RI futurist Mandel and *TIME* correspondent Elmer-DeWitt brought long online experience to the design and management of this forum, which no less a pundit than John Dvorak pronounces one of two online magazines that are any good (the other being Mercury Center). They promoted a high level of interaction between readers and *TIME* staff, and made sure there was a lot of value added—from stories that didn't make local print editions to noteworthy events like the appearance of evangelist Billy Graham in a real-TIME chat drawing thousands of participants.

Some comments from TIME Online participants:

•"When you visit there expecting good conversation, you are rewarded."

•"Tom has encouraged the *TIME* editorial staff to participate...and...with enthusiasm.... Much of the draw for the TIME Online experiment is created by their presence."

•"They really showed other magazines how to go online."

Jim Manzi

Lotus Development President and CEO

The transition's often been painful (1994 saw some whopping losses), but Manzi's been highly effective at redefining Lotus as its spreadsheet business wanes. Both Notes and cc:Mail occupy leadership positions in enterprise computing, enabling global collaboration of ever-increasing speed and efficiency.

In the current climate, in which Lotus's chief competitors are busily acquiring and consolidating their way to what they hope is world domination, these two prize applications (not to mention the relatively low stock price) are also serving to make Lotus an attractive takeover candidate. At press time, AT&T and Oracle were rumored to be among the suitors, but Manzi wasn't talking.

Harry Marshall

Silicon Video Chairman and CEO

Flat-panel display technology (or rather, Japanese ownership of most of the key patents) has been a major bugaboo to the US computer industry. The good screens, based on active matrix LCD technology, add significant bulk and weight to portable machines, to say nothing of representing a major portion of the unit's cost.

All that may be about to change. Silicon Video made headlines in 1994 as the recipient of a rare $22 million grant from the federal Technology Reinvestment Program to enhance its work on "thin CRT" technology, a lighter, cheaper, and less power-hungry alternative to active matrix LCD.

Marshall's task is to coordinate the various efforts it takes to transform breakthrough technology into a winning product and company. With investors and technology partners including Compaq, Hewlett-Packard, and the Department of Defense, Silicon Video (which is still at least a year away from shipping its first product) offers industry-changing possibilities.

Craig McCaw

Investor

Others might go into comfortable retirement after deals like the one in which McCaw sold McCaw Cellular Communications to AT&T, but communications czar McCaw seems intent on still bigger things. The largest single shareholder of AT&T stock as a result of that deal, McCaw is also involved in a Teledesic, satellite-network collaboration with Bill Gates, and was recently a relentless bidder in the FCC's frequency auction.

Ed McCracken

Silicon Graphics CEO and Chairman

McCracken has kept SGI at the forefront of 3D-workstation technology, while expanding its efforts into new markets and maintaining healthy profits. The company's coped gracefully with its acquisition of Mips, a move many thought would be its undoing. Further, McCracken has entered into joint technology ventures with partners from Nintendo to Time Warner, developing game machines, set-top boxes, and other consumer devices well outside its traditional markets.

McCracken also plays a politically strategic role for the industry, serving as cochair of the President's National Information Infrastructure Advisory Council.

Art McGee

Online Activist

McGee works at the Institute for Global Communications as a user support person and the coordinator of Black and African networking. The Los Angeles resident has achieved global respect maintaining a wealth of information on issues of

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540MB	EMP540S	9.5ms	3.5"X1"	$499	$629
1.0GB	EMP1080S	9.5ms	3.5"X1"	$539	$639
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Scott McNealy

Sun Microsystems

Chairman, President, and CEO

McNealy had to engage in some serious price-cutting on desktop workstations in his efforts to keep Sun at the top of the heap, and there was some hilarity in the industry when Sun entered into a technology agreement with once-hated NeXT. But it was all for a good cause as Sun remained the undisputed market leader and its networking capabilities served it well in a world of ever-more-connected computing.

John Moussouris

MicroUnity

Chairman and CEO

Former Mips vice president of R&D Moussouris has remarked that connectivity, in the sense of allowing people to communicate with each other, is going to be a far more important industry than the digital conveyance of content. With that in mind, and with investors like Microsoft (to the tune of $15 million) and TCI (ditto), Moussouris's company has set out to resolve the bandwidth problems of the information highway with a "media processor," a chip designed for communications rather than computation.

The chip will be software-programmable and hardware-independent, something that dovetails nicely with Microsoft's emerging strategy for online video-on-demand, and will run several hundred times faster than a Pentium.

John Norstad

Northwestern University

Long beloved for his ongoing work on the free anti-virus program Disinfectant, Norstand won new fans in 1994 with NewsWatcher, a Macintosh-based program that makes it easy to read Usenet newsgroups.

Robert Palmer

Digital Equipment Corporation

Chairman, President, and CEO

Although the effect of the TV advertising blitz on DEC's market share remains to be seen, it's clear that Palmer is achieving noteworthy results in reversing the company's downward trend. He's streamlined operations relentlessly, stressed the technical advantages of the proprietary Alpha chip, and gone after Digital's long-lost place on the PC desktop. With a historic strength in networking, the company will have some strategic expertise as the communications and online transaction markets grow.

Eckhard Pfeiffer

Compaq Computer

President and CEO

When Pfeiffer announced Compaq's goal of surpassing IBM in global PC market share by 1996, he encountered plenty of skepticism. But by virtue of aggressive cost-cutting and nimble adjustment to changing markets, he's won over customers in the corporate and consumer marketplace. By endorsing AMD's technology for Compaq's products, Pfeiffer also gave a boost to the alternative vendors in the x86 CPU industry.

As for IBM, his prediction was off. Compaq became the world's leading PC supplier two years early, in 1994, overtaking IBM. It also passed Apple to take the leading position in US market share.

Lewis Platt

Hewlett-Packard

Chairman, President, and CEO

The first non-Hewlett, non-Packard to serve as the company's chairman, Platt is providing effective leadership as Hewlett-Packard continues to advance in markets from printers to client-server enterprise computing and multimedia delivery. Now the second largest computer company in the world (after IBM), HP is showing no sign of losing momentum.

Atiq Raza

NexGen

President and CEO

Taking an entirely different approach to the x86 standard, Raza's company, whose investors include Compaq and Olivetti as well as some blue-ribbon VCs, has developed the Nx586, a revolutionary RISC-based and fully Pentium-compatible processor. Raza claims that his chip's architecture bypasses the problems leading to the much-ballyhooed Pentium floating-point bug, and cracks, "I wouldn't believe a business plan that's been put together with a Pentium."

Time will tell—NexGen's floating point model, much tested, is due in the first quarter of 1995.

Howard Rheingold

Author

Rheingold's book *The Virtual Community* reached a new audience as it hit paperback shelves, and his paisleyed presence appeared on TV shows and magazine covers around the world, expounding the human side of all this Internet stuff. He also made new inroads into the text world with "Tomorrow," a nationally syndicated column full of Rheingoldian reflections on technology.

Jack Rickard

Boardwatch

Editor

Like the BBS world it covers, *Boardwatch* is a lot bigger and better known these days. Between the magazine, the veritable Bible of the online world, and the ONE BBSCON conference, which has finally outgrown Colorado Springs and moved to Atlanta, Rickard wields major influence in the BBS world, supporting friend and taking on foe with equal enthusiasm.

Tom Rielly

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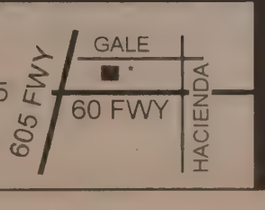

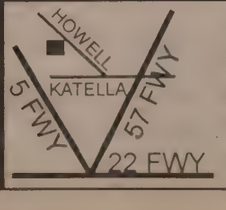

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Rielly and Wickre (he started out with SuperMac in the startup days, did a three-year PR stint at Farallon, and is a founding member of the American Film Institute's Advanced Technology Council; she's currently with Ziff-Davis writing a book about the World Wide Web and serving as managing editor of a forthcoming book called *CyberSource*) cofounded Digital Queers to raise money for gay, lesbian, bisexual, and transgender community organizations.

It's also, they say, a great forum for social and professional networking, and has a strong online presence on AOL. They claim their parties are the best at Macworld; in any case, DQ combines the fun and the socially useful for its many members and beneficiaries.

Jerry Rogers
Cyrix
President and CEO

Rogers continued to nip at Intel's heels during 1994 with Cyrix's alternative 486 technology, which found acceptance among many PC vendors, including AST Research, looking for advantages like increased speed, and reduced heat generation and power consumption. He also entered into an agreement with IBM for the latter to manufacture Cyrix's most advanced chips at its state-of-the-art facilities. Cyrix's next-generation technology, the M1, unabashedly billed as "the fastest x86 CPU for PCs," is due to enter production in early 1995; Rogers, meanwhile, is looking beyond the x86 standard for opportunities to diversify the company's product line.

Heidi Roizen
T/Maker
President and CEO

In June of 1994 Roizen and partner Royal Farros, reflecting a characteristic trend of small software companies during the year, sold their company, in this case to check-printing giant Deluxe. However, Roizen insists that T/Maker has gained a deep-pocketed and well-allied partner rather than lost its wacky soul, and stands to gain access to some new and lucrative markets as a result. With successful product lines in the ClickArt series and the new VroomBook CD-ROMs for children, as well as collaborative ventures from kiosks to cable TV licensing, the Mountain View company has no shortage of opportunities if it can keep its vision intact.

Paul Saffo
Institute for the Future
Research Fellow

Saffo is an influential provocateur who's not above spinning apparently farfetched scenarios to stimulate discussion and new ideas about technology and its implications for the rest of human activity. His particular interest in the convergence of communications and technology made him one of the most insightful analysts of the year's explosive growth and change in those areas for the business and technical communities.

W.J. Sanders, III
Advanced Micro Devices
Chairman and CEO

"The benefits of Moore's Law tend to reach the consumer more rapidly in the absence of a monopoly," says Sanders in what he describes as his corollary to the maxim of Intel's chairman. 1994 was a good year for Sanders and AMD, as they fared reasonably well in court against Intel and scored points with Compaq's endorsement of their technology in its hardware line.

Richard Schulze
Best Buy
Founder, Chairman, and CEO

Schulze originally launched his consumer electronics empire in Minnesota in 1966 with a speciality in audio components. From that beginning he expanded into other areas of mass merchandise, including personal computers; from an unpromising beginning along those lines (his first product line featured blockbusters like Amstrad and Commodore) he built up a take-no-prisoners company with efficient, brand-oriented merchandising, aggressive pricing, and a strategy of saturating geographic areas with outlets. The fall of 1994 saw the advent of the first seven Best Buy outlets in Southern California; twelve more are scheduled for 1995, adding to the competitive environment that's already slowed the momentum of superstore CompUSA.

Neil Selvin
Global Village Communications
President and CEO

Selvin's built Global Village into a mainstay of computer-based communications, and the company's enjoying growth in a tough market as a result, becoming the number-one vendor in the Mac and OS/2 communications market. From the FaxWorks software family, which regularly turns up as a user favorite, to the OneWorld plug-and-play telecommunications servers, Global Village is making a good business out of making it easier for people to communicate.

Richard A. Shaffer
Technologic Partners
Principal

As editor of *Venture Finance* and *Computer Letter*, Shaffer is a vital and trusted information source for the investment community. For the last decade, his conferences, which center on technologies he considers especially interesting to investors, have been a mecca for entrepreneurs, venture capitalists, and miscellaneous movers and shakers to meet, greet, and launch a little company now and then.

Stan Shih
The Acer Group
Chairman

Departing somewhat from its core market in PC-compatible technology, Acer made headlines late in the year as the first licensee of Apple's Macintosh operating system. The resulting machines are slated for Pacific Rim distribution, and represent the sort of responsiveness to opportunity Shih has historically exhibited. In his recent efforts to make the Taiwanese giant more globally competitive, he's developed a strategy of localizing Acer's subsidiary companies and giving them more autonomy. His combination of Western entrepreneurial skills with traditional Taiwanese business practices have combined to make Acer an efficient, productive global company.

Michael Slater
Microprocessor Report
Publisher

When the Pentium's buggy, who you gonna call? *Microprocessor Report*, of course, where Slater and his well-informed, technically sophisticated contributors bring balance and perspective to the issue. In a fast-moving industry where today's state-of-the-art processor is next week's antique, *Microprocessor Report* is the indispensable reference for hardware designers.

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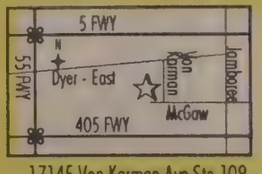

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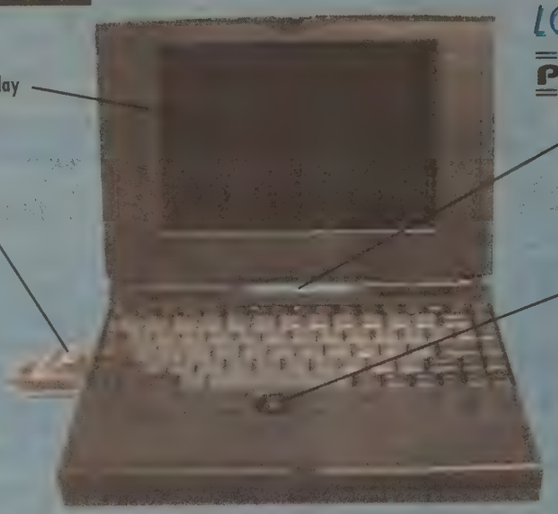

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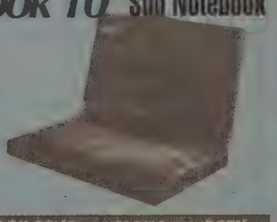

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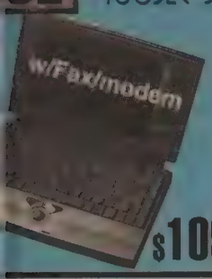

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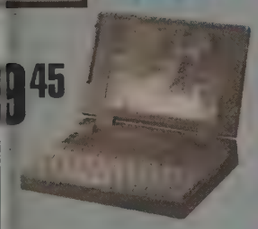
340 486SLC-33



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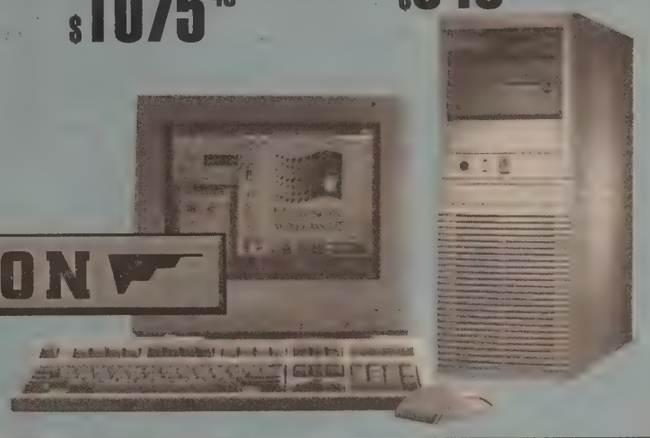

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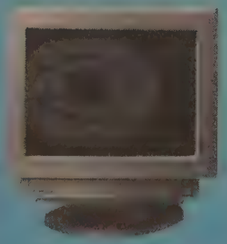

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1994 Year In Review

Michael Spindler

Apple Computer

CEO and President

Spindler has pleased shareholders and customers by restoring Apple to profitability and competitiveness. The PowerMac transition is well under way as the new platform receives generally enthusiastic acceptance, and margin-cutting has resulted in Mac prices that have old-timers shaking their heads.

Another shock to Apple traditionalists was Spindler's announcement that Apple would begin to license the Macintosh operating system to other hardware vendors, raising the previously unthinkable spectre of Mac clones.

There are still plenty of unknown quantities at Apple, including the future of the Newton (which hasn't been nearly as well received as the PowerMac) and the eWorld online service, as well as other forays into the consumer marketplace. So far, however, Spindler's shown a much-needed blend of vision and pragmatism as Apple faces a new technological era where ease of use is only the beginning.

Robert David Steele

Open Source Solutions, Inc.

President

Former Marine and denier-to-the-death-of-CIA-employment Steele learned in the just-in-time intelligence world that timely information was worth a lot more than a belated exclusive. In the course of disseminating this principle around the world and holding a yearly Open Sources conference in Washington, he's developed a unique role as a builder of bridges between his erstwhile colleagues in the research and intelligence communities and the world of open sources information available on the Net.

This occasionally leads to misadventures, as it did in 1994, when Steele was accosted in his hotel room by FBI agents while attending the Computers, Freedom & Privacy conference in Chicago. Turns out, however, they were looking for some high-tech malefactor that didn't look a thing like him but went by the name of Agent Steel.

Donald Steinbrecher

Founder and Chairman

R. Douglas Shute

President and CEO

Steinbrecher Corporation

Steinbrecher, then a professor at MIT, founded the company in 1973 to work on issues related to high-performance radio frequency. Since 1988, under Shute's direction, it's focused on high-performance digital radio subsystems. The company's developed flexible, relatively low-cost devices capable of handling broadband transmissions and changing frequencies as required. According to big Steinbrecher fan George Gilder, this technology stands to drive the cost of wireless communications down very quickly.

Team OS/2

The more things change....

Guy Kawasaki (never mind Steve Jobs) would no doubt be astonished at the transplantation of the fervor-and-zeal school of guerrilla marketing to IBM, but so it is. It remains to be seen whether this merry band of OS/2 enthusiasts will be as successful as their spiritual ancestors in Cupertino, but clearly (see sidebar) even IBM has discovered The Macintosh Way, or at least its higher precepts.

Glenn Tenney

The Hackers Conference

Chairman

For nine of its last ten years, Tenney (whose involvement with the personal computer industry goes back to 1976 when he cofounded a company called Software Technology Corporation) has chaired the Hackers Conference, an invitational event where distinguished innovators meet to discuss what they're doing with technology and what's next. Past visitors have included such pioneers as Doug Engelbart, Don Knuth, and Marvin Minsky; discussions range from high-bandwidth fiber networks to nanotechnology to K-12 education, and many projects (even companies) have had their beginnings here.

Tenney also made a respectable showing as a first-time Congressional candidate in 1992, scoring 11% of the Democratic primary vote after conducting his campaign almost entirely online. With former opponent Tom Lantos now making noises about resigning after his current term, it'll be interesting to see if Tenney hits the virtual campaign trail yet again.

Patrick Volkerding

Nexsys Electronics

Reader Jim Haynes nominates Volkerding as an example of the sort of ad-hoc cooperative endeavor that's enabled so much of our current technology to exist: "Patrick, in his spare time, is the producer of the Slackware distribution of Linux, the free UNIX look-alike developed by Linus Torvalds and a cast of, well, at least tens of people all over the world. Linux is by far the most popular of the available free 'UNIX' systems for the PC. One reason it is so popular is the ease of installation and getting started; and the main reason it is so easy is that Patrick and others like him have bundled up the work of those tens or hundreds of developers into a neat package that is easy for the novice to install.

"Patrick has produced a new release of his 'Slackware' distribution every few months. The distributions are available free of charge over the Internet, or at nominal cost on CD-ROM or maybe even on floppy disks yet.

"Because of his work we have the best of both the free and commercial

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- 16 Bit SCSI Sound Card
- **2 Amplified Stereo Speakers & 4 Top CD Titles**
- **540MB Enhanced IDE Hard Drive**
- One Floppy Drive (3.5" or 5.25")
- PCI/VLB IDE Enhanced Hard Drive Controller
- PCI/VLB Diamond Stealth 64 (2MB VRAM)
- **15" Flat Screen Monitor**
- Mini Tower or Desktop
- 101K Enhanced Keyboard

486DX2-66 VLB $1905
PENTIUM-60 PCI.....$2326
PENTIUM-66 PCI.....$2426
PENTIUM-90 PCI.....$2526

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- Serial Mouse w/Pad

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- 101 Key Enhanced Keyboard
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- Serial Mouse with Pad

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486DX-2/50 Mono/STN ..$1645/2075
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VLB MB486DX2-66/256K 3 VLB, ZIF (4X30P/2X72P) 293
PCI MB486DX2-66 (DX4/100) 256K 4 PCI/2 ISA/2 VLB/ZIF (72P) 318
PCI PENTIUM-60/256K OptiChips/4 PCI/Fan 626
ASUS PCI EISA Pentium-60/256K up to 128MB/Fan 828
Intel Made Pentium 66MHz/256K w/Enhanced IDE IO/Fan 760
PCI ISA Pentium-90 256K 4 PCI, SIS Chip, Fan 825
PCI ISA Pentium-90/256K 4 PCI, Opti Chips, Fan 875
Intel Made Pentium 90Mhz w/IDE IO/Fan 895
PCI EISA Pentium-90MHz Dual Processor, 4 PCI/4EISA, 6x72p 1855
IBM OPAL VLB 486SLC2-66/54K W/CPU & MATH 175
IBM VLB 486BLX3-75/256K BUILT-IN IDE IO W/CPU & MATH 220

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SVGA 512K TRIDENT 35
SVGA 1MB TRIDENT 53

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DIAMOND STEALTH 64 1MB/2MB DRAM (OEM) 145/188
DIAMOND STEALTH 64 2MB VRAM/4MB VRAM (OEM) 275/405
DIAMOND VIPER SE 2MB VRAM 275

PCI
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DIAMOND VIPER SE 2MB VRAM (OEM) 249/389
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ATI Graphics ProTurbo 2MB/4MB VRAM (original) 365/555

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ADAPTEC 2742TK EISA SCSI-II CTRL W/KIT 335
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ADAPTEC 2940K PCI SCSI-11 w/KIT (OEM) 245
ADAPTEC 2940 PCI SCSI-II (BARE) (OEM) 215
BT445S BUSLOGIC VLB SCSI-2 (OEM) 215
BT946C BUSLOGIC PCI SCSI-2 (OEM) 215
KT910A BUSLOGIC PCI IDE CACHING CTRL 225

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COLORADO JT350 340MB TRAKKER (EXTERNAL) 340
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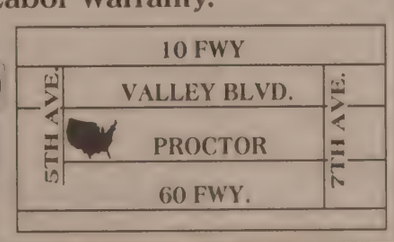

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"Although he must get tons of email from Linux users. Patrick has always been friendly and quick to answer when I have sent him questions."

Ted Waitt

Gateway 2000

Chairman, President, and CEO

Sure there's a shakeout in the PC business and a lot of its competitors in the mail-order business are hurting, but not Gateway, which is still experiencing sales that nearly double the previous year's figures. After a year that saw the company's first stock offering and an expansion into Europe, Waitt continues to drive an efficient, customer-responsive business that serves what he characterizes as a technically sophisticated consumer market. He's bullish on Pentium, saying orders have actually increased since the bug announcement and that Gateway is the nation's leading supplier of Pentium-based systems.

John E. Warnock

Adobe Systems

Chairman and CEO

Citing the impact of distributing company information via Web pages, Warnock believes the world is on the verge of a technology-driven social change unparalleled since Gutenberg. Toward that end, he's keeping Adobe at the forefront of authoring and document exchange tools, a position enhanced by its recent merger with Aldus.

Jim Warren

Columnist

Warren took a brief break this year from hell-raising on behalf of computer-based voter access to government to accept the Hugh M. Hefner First Amendment Award honoring his work in the field.

Since last year's successful passage of legislation allowing online access to bills in progress in Sacramento, Warren has gone on to form the GovAccess mailing list on the Net, thereby simultaneously informing hundreds of journalists, activists, and interested bystanders of related issues, and is a frequent speaker on civil liberties subjects. He also continues to serve on Autodesk's board of directors.

Ken Williams

Sierra On-Line

Chairman, President, and CEO

In addition to keeping Sierra's preeminent position in PC entertainment market share, Williams has a strong interest in the emerging area of online entertainment, particularly interactive gaming. Toward that end, he's been involved in a joint venture called the ImagiNation network with AT&T; during 1994 the relationship changed somewhat as Sierra sold its share back to AT&T and entered into a contract to develop networked content for the network.

Lou Williams

Castro Middle School, Campbell

Teacher

Student Matt Clark puts in a good word for this asset to education in Silicon Valley: "Mr. Williams is a teacher at Castro Middle School, and he helps anyone who needs help using the network, finding the right file and printing files. He helps with many other problems too."

We'd like to thank Matt for bringing Mr. Williams to our attention, and we're happy to salute his work. We'd also like to commend the hundreds of unnamed teachers, wherever they are, who help students reap the benefits of technology.

Ann Winblad

Hummer Winblad Venture Partners

Partner

Since cofounding Hummer Winblad as a software-only venture capital firm a few years ago, Winblad has earned a reputation as both a knowledgeable industry observer and as a relentlessly proactive asset to her portfolio companies at all stages of their evolution. In addition to serving as a board member on companies including Berkeley Systems and Humongous Entertainment, she also served on the boards of Reference Software, T/Maker, Slate, and Central Point Software, and facilitated their advantageous acquisition by WordPerfect, Deluxe, Compaq, and Symantec, respectively.

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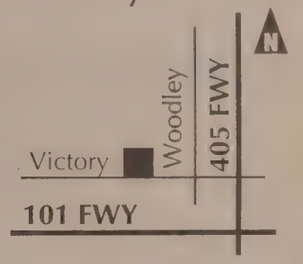

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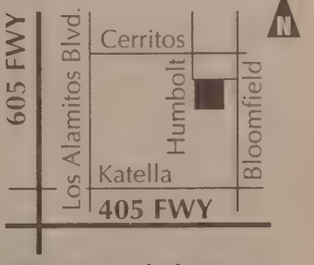

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Intel Pentium-66	$509
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- 15" 1280x1024 .28 NI Super VGA Monitor
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- 101 Enhanced Keyboard
- Hi-Resolution Mouse
- Mid Tower Case, 8 Drive Bays

VL-Bus Media Pro

- Intel Pentium OverDrive Ready
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- 101 Enhanced Keyboard
- Hi-Resolution Mouse
- Mid Tower Case, 8 Drive Bays

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- 115W Hi-Fi Stereo Speakers
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- 101 Enhanced Keyboard
- Hi-Resolution Mouse
- Mid Tower Case, 8 Drive Bays

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By Michael Robin
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Mosaic & Netscape:

The Changing Face Of The Internet

Marc Andreessen on the impact of Mosaic and the future for Netscape

In March 1993, after three months of concentrated work at the National Center for Supercomputing Applications (NCSA), Marc Andreessen and Eric Bina released the first version of Mosaic for UNIX, making it freely available to download from the Internet. Within months, Mosaic had captured the attention of both longtime Internet users and newbies, including a significant proportion of businesses. By October 1994, there were an estimated three million people using NCSA Mosaic for UNIX, Windows, and Macintosh.

NCSA Mosaic is a graphical information retrieval interface for the Internet, which makes it significantly easier to access and distribute information on the Net. Information producers can use it to present documents that include not only text, but graphics, audio, and even video clips to be viewed online, in real time. When used as a browser for the World Wide Web, Mosaic allows users to navigate through multimedia documents by clicking on hyperlinked words, icons, and images. Equally important, Mosaic has shown a broad base of users that the Internet is less a mysterious technical environment than it is an integral tool in our social, intellectual, and economic lives.

Marc Andreessen was an undergraduate student in Computer Science at the University of Illinois, Urbana-Champaign, working at NCSA. He wanted to figure out a way to make information on the Net "interesting and compelling for people to explore." The solution, explains Andreessen, was to "build a program that pulled together all the resources of this global network," the Internet. To accomplish this he assembled a team of six fellow programmers at NCSA, and

in the tradition of the Internet, they proceeded to build NCSA Mosaic, incorporating anything else they could find on the Net that would be useful.

Following his graduation from the University of Illinois, Urbana-Champaign, in 1993 with a BS in Computer Science, Andreessen left the relative isolation of the academic world and southern Illinois and came to California. He began working at Palo Alto-based Enterprise Integration Technologies (EIT), the company that manages CommerceNet. Andreessen's career took another turn when he met Jim Clark, founder and former chairman of Silicon Graphics. Their initial meeting established a partnership that led to the formation of Mosaic Communications Corporation in April 1994. By fall they had released a new (beta) Internet browser designed for home users, Netscape. In November, the company changed its name to Netscape Communications in an effort to establish its corporate identity separate from Andreessen's earlier work at NCSA and to avoid potential difficulties from using the name Mosaic. On January 1, 1995, they moved across town into a larger office complex to accommodate their continued explosive growth.

I met with Andreessen in Netscape's Mountain View offices to talk about the impact of Mosaic and Netscape—upon how the Internet is used and who is using it, as well as its impact on him. (Netscape Communications Corporation, 415/254-1900 or 1-800-NET-SITE; Home Page: http://home.mcom.com/)

What was the original problem you were trying to solve by creating Mosaic?

We decided that the thing to do was build a program that pulled together all the resources of this global network and all these really powerful desktop computers we had sitting there. We wanted to do something that would make information interesting and compelling for people to explore.

Was your goal a browser for the World Wide Web?

The original goal was to encompass it all; to access everything on the Internet. We just incorporated, borrowed, or stole as much stuff from as many people as we could, which is how we were able to write it in three months. (Netscape, on the other hand, was not written in three months and not by two people.)

And this was originally done with the academic or scientific community in mind?

It was definitely a research prototype. We made a number of assumptions in the beginning, like you had unlimited bandwidth, for example. We just assumed that when you were pulling things over the network you did not need to worry about how long it takes to pull them over. This has led to some interesting situations for people trying to use that code, or use derivatives of that code, on consumer-grade or typical business situations.

From where you were sitting in 1993, as Mosaic took off, what unexpected directions and developments did you see?

The first was the widespread popularity that started to accrue—the number of people that were using it, the attention it started getting. Then of course, the process of commercialization. The university decided there was money to be made here. The process they went through was something I had not seen before.

There were continual ongoing debates about what sort of copyright to put on it, how free to make it, how available to make it, how to commercialize it, whether to actually derive revenue from it or whether to treat it like the research prototype that it was. There were also the more mundane questions of whether to charge per copy or a flat fee to companies that wanted to use it and whether to give out source [code] as had been done with most previous NCSA programs.

As early as the spring of '93 the administrators at NCSA were encouraging us to start our own company. It was never quite clear how to do that or what we needed to do. It took moving out to California and meeting people here, in particular meeting Jim [Clark], to realize how we could do that.

All of a sudden Mosaic was being used by a growing variety of people to do more and more things. What sort of things surprised you in how people were using it?

It was certainly a continual surprise the way people were using it. In particular, the fact that businesses were coming up [on the Net] and doing interesting things with it. Also, that businesses were starting to use it for their internal networks for information sharing, for collaboration. It indicated to me that there was this hole out there that wasn't being filled by existing software for networks. If this code was not necessarily the answer, at least is was pointing in the direction toward where things had to go, to where there was a big opportunity to make these networks really powerful.

When you say businesses doing interesting things on the Net, is this mostly the type of things we usually hear about—press releases and marketing information?

That was the first wave of use, but they kept trying, and they continue to today, to push the envelope of what they can do. They see where they want to go. They want to offer goods and services over the Net as well as information sharing within their company and other companies that they are collaborating with. There is a broad range of ways companies want to use this and they just keep pushing and pushing.

Certainly with the research prototype businesses hit a number of walls, such as security, where you couldn't really do transactions, and lack of a robust cross-platform implementation that made it very difficult to deploy it widespread across a corporation. The server software wasn't robust enough to let you offer commercial transactions over the Net and there was no standard way for linking into all sorts of back-end systems.

A lot of people did some interesting things to get past those walls. But fundamentally the architecture itself just wasn't there to meet the range of things people wanted to do with it. This is why there is both such pressing demand for something that takes what Mosaic started and branches off from there into the commercial realm. This is why we started this company.

Mosaic was neither the first nor only graphical tool on the Internet. Why do you think it took off so fast?

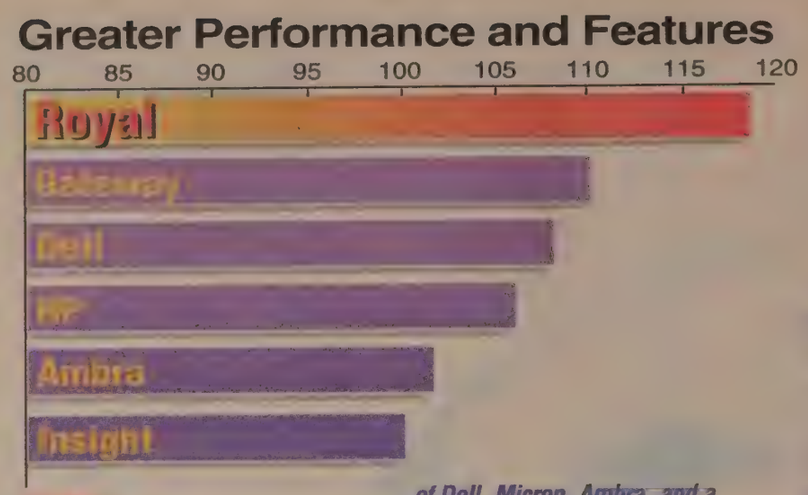
It was fun and easy to use. People could pull it down [from the Net], install it, and boom, it worked.

The other part was, and this gets back to the server side, it was straightforward for people to do things specific to what they were doing. It was easy to build applications on top if it. People would be able to pick up the server software and be able to build an application on the back end that had something to do with their business, their activities, or their research. They could then make that service available to the entire network, and since everyone had the front end everyone could access it. It became a very powerful way to build applications over the network.

How would you clarify the relationship between Mosaic and other Net resources, in particular Gopher and WAIS? And the relationship of Mosaic to Netscape?

With relation to other Internet resources, basically, Mosaic treats them as legacy systems that it ties into. WAIS is a special case because it is a search engine that can be easily tied into on the back end.

Gopher got caught in the evolution of the information systems themselves. Its roots are in the more traditional VT100 view of the world. Mosaic



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MOSAIC & NETSCAPE *continued...*

and Netscape treat it as a legacy system that you can access but does not do a whole lot beyond that.

Mosaic in relationship to Netscape. Because of what it accomplished and the experience of building it, we consider Mosaic to be the research prototype for this kind of software. We know we made a lot of mistakes. In fact, they were pointed out to us in great volume over the course of '93, by lots of people.

You attributed Mosaic's success to "it's fun and it's empowering." If it is mostly being used by companies to disseminate information, there really is not much interchange or interactivity. How is this empowering?

The key here is not any specific application. The key here is that the Net is a communication medium, it's a channel. Uniquely as a communication medium, there are no restrictions over what can go over it, what you can do on it. You are not limited to any of these previous models of TV and cable or even newspaper or radio.

Increasingly what you can do, and the next wave of what people are doing on [the Net], is private activities. So go from point A to point B, establish a secure link, and do whatever you want. What that doesn't do, it doesn't interfere with any of the other activities that happen on the Net. In fact, in the process of this evolution, the result is that Internet access is going to become much more widespread. It is going to become even more powerful and an even greater resource for people doing the sort of traditional activities that have always taken place on the Net.

The key here is that, as the uses of the network expand, the network doesn't get less powerful or more restrictive. As the infrastructure itself grows, the Net becomes more open and better able to accommodate what everybody wants to do.

The software we are developing here tries to expand the range of things that people are able to do on the network, particularly for nonprofit organizations where there are very innovative people working with the software.

The initial releases of Mosaic and Netscape are not very interactive. For example, a user would need to launch other applications to do almost anything interactive. How will Netscape evolve? Will these other applications be more integrated?

It definitely has to evolve. The communication aspects are going to be drawn out more explicitly in the future.

Netscape addes a row of buttons and menu options to make navigating the Internet easier.

Could you say more about that?

We want to make it easier for people to build applications that involve communication. You get a powerful set of capabilities when you tie together information resources with communication. People being able to explore information, being able to share with one another, that is the sort of thing we are going for.

There has been a lot of attention on Mosaic, the client software, but very little on the server software. Was that part of the same project?

People have gotten distracted by this glitzy front end.

Rob McCool, who is on staff here, basically wrote httpd from the ground up and maintained the NCSA httpd server over the course of '93. That had as big a role to play as Mosaic did. It was easy to pull down and set up. Rob also did a number of really cool things, making it easier for people to tie in other back-end systems.

A big part of what we are doing in this company is that we are putting more resources into the back end than the front end. We are putting more development work into the servers and into integrated applications built around the servers than we are into the client. Not only is that where there is real commercial value, but also because there is so much interesting work that still needs to be done before you are able to offer commercial services over the network—you need everything from access authorization using databases to maintaining lists of users and their access privileges to transaction control.

There has been a lot of talk about a paradigm shift created by Mosaic. The PC took computing power to the individual, breaking down the monolith of the mainframe. What type of shift has Mosaic created?

Mainframe to PC basically scattered everything out. It put a computer on everyone's desk. This ties it all together and takes advantage of that happening. The result we get is much, much, much greater than the individual parts.

One impact is the creation of a new job category—people being hired as "html'ers" or "web masters." This is changing the traditional framework for communication on the Net. We end up with professionals putting up the information.

I don't think it is a shift. Both are increasing. If you look at the rate of change, one is coming from behind and is growing faster than the other. But in terms of what the Net is used for and how it is used, traditional applications still dominate and are continuing to grow just as fast as they ever have. I think these two sets of worlds, these two modes of commercial/noninteractive on one side and noncommercial/interactive on the other complement each other. I think they are going to feed back and forth off of one another.

Does Netscape address a different set of questions than Mosaic?

In its first incarnation, which is what you see now, the key things we were addressing were the show-stoppers that were stopping commerce from taking place—the lack of security, robustness, and performance. In particular, to reach into the home over slow lines—people need to be able to access everything. There is no reason to limit them. At this point, about the only thing they cannot reasonably do is video. There are fairly effective ways to do audio over 14.4 and we will be exploring that. Those were the first things that we tackled.

Is the slowness that people experience with Netscape over 14.4 connections a result of the software or the applications that people build? In other words, is it the technology or the way Web pages are designed, with big graphics and designers not working with the current state of the technology?

I think people know where the medium is and

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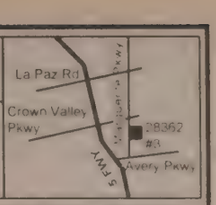

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THE KEY HERE IS THAT, AS THE USES OF THE NETWORK EXPAND, THE NETWORK DOESN'T GET LESS POWERFUL OR MORE RESTRICTIVE.

what they want to do with it. I think it is up to those of us doing the software to really do the software efficiently in such a way that you can reach into the homes. There are things that we have yet to do that will make 14.4 more compelling. There are things about Netscape that could be more efficient in presenting the user experience. We will certainly be pushing forward on those. I think the trend is absolutely going to be making 14.4 users have the same experience as the T-1 users have had all along.

What is the W3 Consortium?

A body that's forming a consortium along the lines of the X-Consortium, sponsored by MIT. It is going to be in a standards-setting role for next generation protocols, formats, and architectures for the Net, particularly for a lot of things companies want to do with it.

We were founding members. That means that we are participating in the processes that are evolving the next generation of stuff. So far the bulk of the work that has gone on at W3C has been devoted toward security because that is such a pressing issue. The faster security gets out there in a way that we can all intercommunicate, the more clients we will be able to sell, the more servers we will be able to sell, and so on. That's in everyone's best interest, and there are already a number of companies working together under this umbrella to figure this out.

The security protocols you are proposing is "https" and something called Secure Socket Layers. What are sockets and how does this impact Netscape?

Sockets are the abstraction that you use when you are communicating over the Internet. To go from point A to point B on the Internet to pass information from one point to another, you open a socket. What that really means is that you have this place that you can stuff data down or read data from. The first thing you do is open a socket you write, write, write, then you read, read, read, and close down the socket. The program on the other end is going to be there listening. As soon as it receives a connection it is going to establish its socket, giving you a channel to receive the information, write it back out, and close it down.

That is fundamentally how Netscape works overall; the way it talks to servers across the Net. This is a standard way of doing things over the Internet. Significantly, this is also becoming a standard abstraction across all kinds of different platforms. The fact that TCP/IP is fairly widely adopted across all the big platforms—UNIX, the mainframe world as well as Macs, PC, even OS/2—means that the sockets layer is becoming the de facto API or way of looking at how you use TCP/IP. This provides commonality on the bottom layer for doing the communication.

What you don't have in that layer is a standard approach to security. Implementing security on top of that basically gives you two options. You can either implement security in terms of one particular way of talking over TCP/IP, talking over a socket. Or you can implement security by making a new layer that sits in between sockets and the application protocol.

Secure Sockets Layers is this layer that sits above TCP/IP, but it sits below things like http, ftp, gopher, telnet, and sntp. It basically provides a way for programs that are already written in such a way that they use sockets, to use secure sockets. This means that there is a way to authenticate both sides of the communication before the actual communication starts, and the communication itself in both directions is fully encrypted.

And this is seamless for the user?

Ideally it is seamless for the user. Also ideally, the user understands the implications for the activity that is taking place. That is, how secure is the link? Who is the person at the other end and are they who they claim to be? What is the strength of the encryption and how certain can I be that somebody isn't breaking into it? How certain am I that somebody isn't interfering with it as it's on its way to me?

Another standard, called Secure HTTP or SHTTP, is being proposed by EIT. Is this a competing or complementary protocol? Can they work together?

I consider them complementary. SHTTP, which I worked on when I was at EIT, takes the world view that what you are doing is using a particular application off a protocol called http to exchange messages across the channel. So SHTTP does things with those messages. It lets you take objects inside those messages and encrypt them, digitally sign them, and do things like that.

It addresses a distinct, but slightly overlapping, problem space. You can get many of the same effects by using either. What you can't do today with SSL is do things inside the message stream itself. The entire stream is encrypted. You can't reach inside and do particular things with individual objects.

What you can't do with SHTTP, today, is use it across other application protocols like NNTP for network news, or Telnet.

They come out of different philosophies. They address some of the same problems, but they are also quite a bit different. I think they are complementary. They are both proposals by companies to the W3C working group on security, and the specifications for both are freely available on the Net. We may at some point support its SHTTP. From our point of view there is certainly nothing religious about this.

Another way to look at them as complementary is that you could in fact layer SSL underneath SHTTP. You could run them both at the same time. They wouldn't conflict with each other.

The other thing to keep in mind, there are lots of other proposals about security. They all address different problems. There is a lot of work going on for embedding security in the IP layer for the next generation of the Internet protocol. That does not do us a lot of good today because the systems that are out there don't have that. But someday that may take over from what SSL is doing because it may just be buried in your networking layer.

Using RSA technology means that you end up producing two versions of your software, a domestic, full-strength version and a "lite" or crippled export version. How will Netscape Comm. handle this and have you encountered any reactions, in particular from large transnational corporations?

The basic story is that we are a US company and as such we are bound by standard US export laws. That means that we have obtained export clearance, except for a small group of countries, for our full security implementation but with limitations on the key lengths for the encryption algorithms. For example, one of the encryption algorithms that we commonly use is called RC4. It's a lot like DES except that it allows for arbitrary key lengths as well as a number of other interesting properties. We have export clearance for 40-bit RC4. A 40-bit RC4 message takes on average about 64MIPS-years in processing time to break. That is enough to keep you from cracking it in ten minutes but it is not enough where the NSA or somebody like that wouldn't be able to break it relatively easily. That is why they set the limit

continued on page 176

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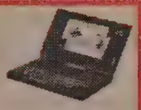

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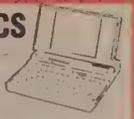

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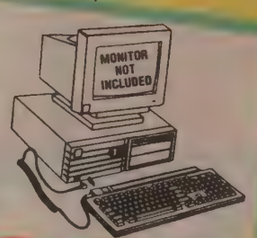

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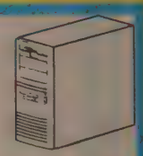

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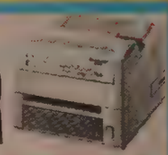

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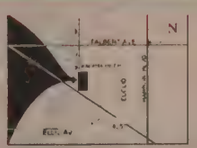

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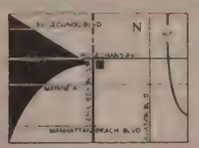

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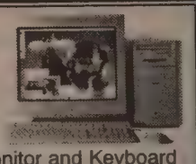

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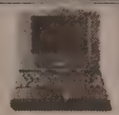

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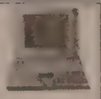

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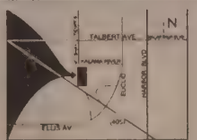

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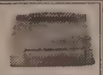

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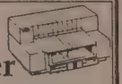

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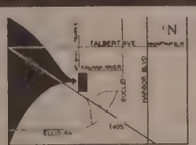

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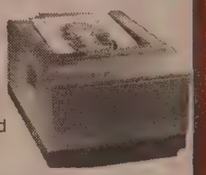

- 300 X 300 dots per inch
- Printer speed up to to 4 pages per minute
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- 2MB memory upgradable to 4MB
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- Serial/Parallel AppleTalk interfaces

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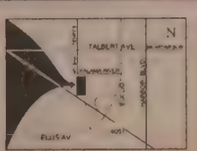

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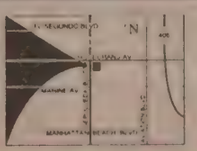

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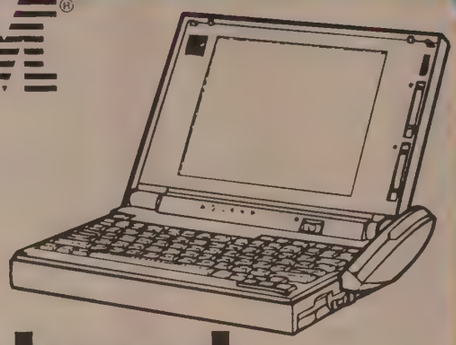

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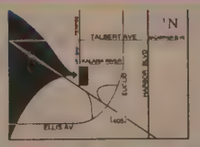

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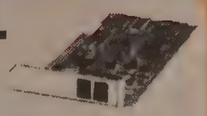

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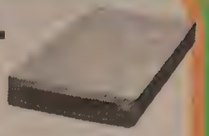

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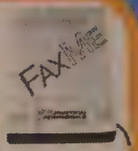

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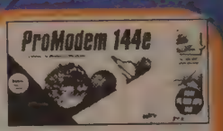

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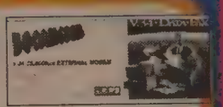

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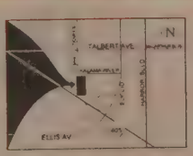

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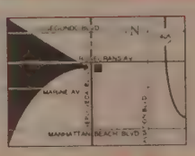

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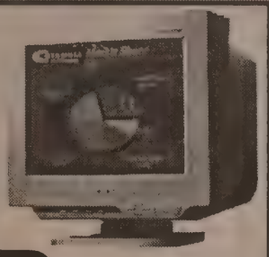

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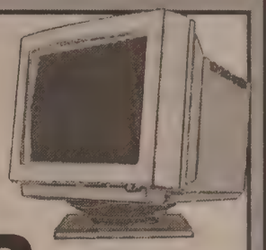

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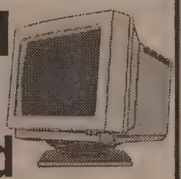

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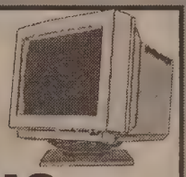

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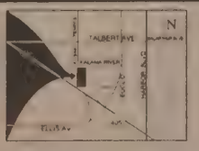

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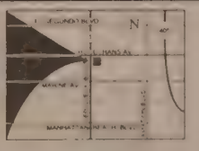

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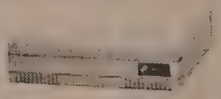

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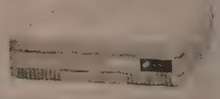

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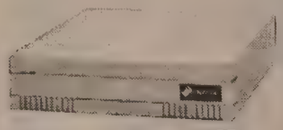

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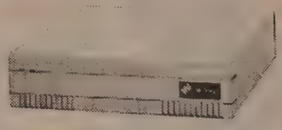

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MODEL 1.2
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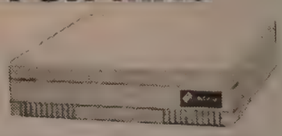

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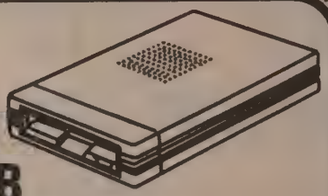

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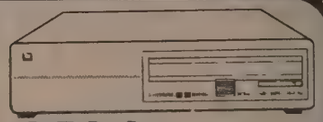

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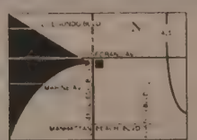

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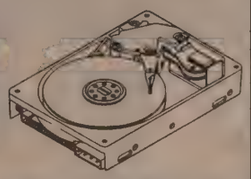
SCSI HARD DRIVES

Quantum™
540MB SCSI HARD DRIVE



1" ht. • 12ms Access • 300,000MTBF • 2 Year Warranty
128K Cache
#1899029
Maverick
2M30540MVS

$259

CONNER
540MB SCSI HARD DRIVE

3.5" X 1"HT.
10msec Access
CP-30540
#1802221

$257

Quantum™
1.08 GIGABYTE SCSI HARD DRIVE

1.08 GB SCSI-3, 9MSEC, 1" HT, 5 Years Warranty
Model 1080S
#1899052

$559

CONNER
1.06 GIGABYTE SCSI - II HARD DRIVE

1" SIZE • 9MSEC FAST ACCESS • 256K CACHE
SMALLEST 1 GIGABYTE
#1844890

$537

Quantum™
2.1 GIGABYTE SCSI-II HARD DRIVE

Empire 2100s
#1928110

$997

SEAGATE 1.05 GIGABYTE SCSI HARD DRIVE

- 9msec Access Time
- 1/2 ht
- 256K Cache
- 5 Year Warranty

ST31200N
#1836338

Seagate

$559

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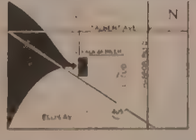

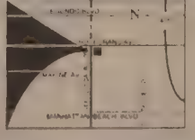

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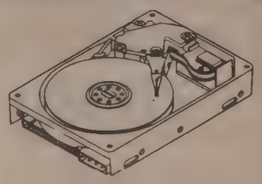
IDE HARD DRIVES

213MB 3.5" IDE HARD DRIVE



3.5" IDE Hard Drive 1" Ht.
13ms Average Access Time
SHD3211A
#1936247

$137

Limited to supply on hand

250MB 3.5" IDE HARD DRIVE

3.5" Form Factor 1" Ht.
SHD3122A
#1786011

$145

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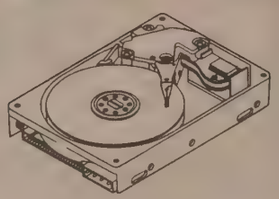
Maxtor 290MB IDE HARD DRIVE

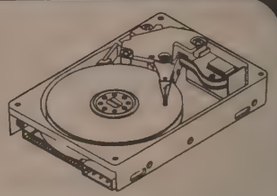


MAXTOR 7290A
#1949597

$155

Limited to supply on hand

Maxtor 345MB IDE HARD DRIVE



1" HT. • 15ms Access Time • 345MB Formatted Capacity
MAXTOR 7345A
#1781762

$159

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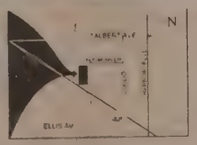

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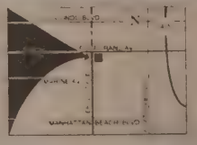

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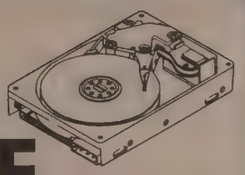
HARD DRIVES

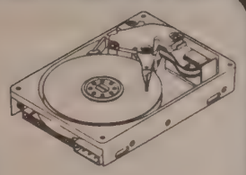
Maxtor 420MB IDE HARD DRIVE



3.5" x 1" Ht.
12 msec Access Time
256K Buffer
7420AV #1972979

$185

420MB IDE HARD DRIVE



3.5" x 1" ht.
#1920787

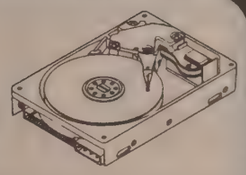
$177

CONNER 420MB 3.5" IDE HARD DRIVE

14ms Fast Access
3.5" X 1" • 32K Buffer
IDE Interface
#1886218

$198

560MB IDE HARD DRIVE



3.5" x 1" ht. 12MSec Access
256K Buffer
#1949933

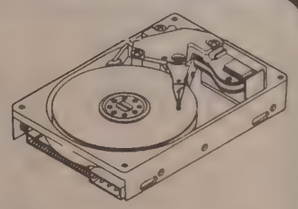
$219

CONNER 540MB IDE HARD DRIVE

3.5" X 1"HT. • 12msec Access
CFA540A
#1802210

$247

CONNER 850MB ENHANCED IDE HARD DRIVE



- 1" x 3.5" Size
- 12MSec Access
- 256K Buffer

CFA850A
#1981513

$369

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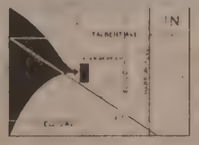

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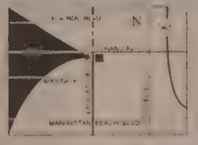

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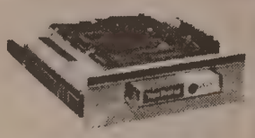
COLORADO MEMORY SYSTEMS INC.



250MB TAPE BACK-UP

40/80/120/250 MB Format
Internal Drive runs off floppy controller
Uses DC-2120 Tapes

$139

Model DJ-20
#1610068

SUMMIT MEMORY SYSTEMS INC.

250MB TAPE BACK-UP

250MB Internal Tape Backup
Runs off of Floppy Controller
Central Point Software For Windows & DOS
2 Year Warranty

$135

Model SE250
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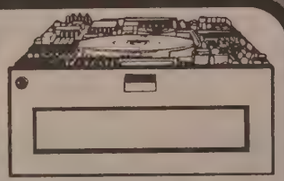


TAPE•STOR 250MB INTERNAL TAPE BACK-UP

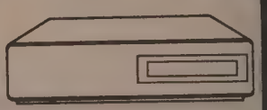
Uses DC2120 Tape Cartridge
C250MQT

TAPE CARTRIDGE INCLUDED

$129

#1825747

CONNER



TAPE•STOR 250MB EXTERNAL PARALLEL PORT TAPE BACK-UP

Up To 250MB Back-up, External Plugs Into Parallel Port.

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- 195ms Access Time
- AT Interface and Cable
- SuperQuad 4X

CD-55
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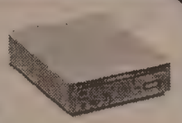
PLEXTOR Formerly Texel INTERNAL QUAD-SPEED CD-ROM



SCSI CD-ROM
150ms Access
600KB/sec Transfer Rate
1MB Buffer
2 Year Warranty
TXL-PX-43CH
#1934957

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NEC MULTISPIN 4xi

- Internal Quad Speed CD-ROM
- 600 KB/SEC transfer rate
- 220ms Access Time
- 256k cache

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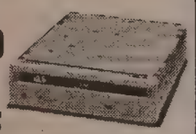
SONY. DOUBLE-SPEED INTERNAL CD-ROM DRIVE



- MPC 2 Compatible
- 320MS Access Time
- 300 KB/S Transfer Rate
- 64 Kb Cache Buffer
- Multisession Kodak Photo CD
- CD-ROM Interface Adapter

CDU33A
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"EDUCATOR" COLLECTION Multimedia Kit

Internal • Double-Speed 320ms access time, 300KB/S data transfer rate • Multisession, Photo CD ready Cable, Mounting hardware, and installation video.

15 CD SOFTWARE TITLES
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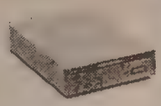

- 250 ms Access Time
- 300 KB/S Transfer Rate
- With interface card

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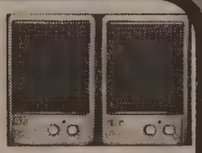
Labtec CD-I SPEAKERS



- Shielded Computer Speakers
- Works with Sound Cards that have 3.5mm jacks
- 3.6 Watts x 2

CD-1
#1945331

$11.99

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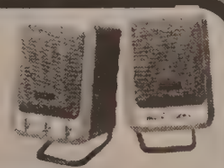

- 10 wattsx2
- Bass, Treble, volume controls
- AC adapter
- Speaker stand

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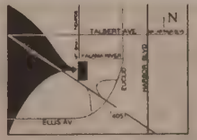

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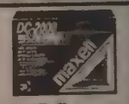
DC6150 1/4" 150MB DATA CARTRIDGE 620 FT.

#1630592 **$13.99**

DC2000 1/4" 40MB DATA CARTRIDGE 205 FT.



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Compatible with Teac CT600F

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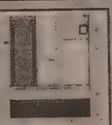
3.5" 128MB REWRITABLE OPTICAL DISKETTE



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FREE STORAGE CASE

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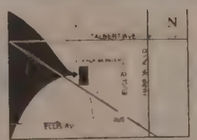

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Talk to your PC in a natural continuous way. Get things done faster and more accurately than with a keyboard or a mouse. Listen™ to popular programs like Microsoft Office™ Suite, WordPerfect™, Corel Draw™, and Asymetrix Compel™ letting you use the product immediately.

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- Speaker independent
- Works w/486's
- 10,000 Windows Commands
- With headsets

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Microphone Jack • Game Port • Audio Recorder Audio Reminder Talking Clock • Talking Calculator • Audio Clip Library • Timer and Stopwatch

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- True 16-bit CD-quality stereo sound FM sound board
- Full compatibility with all major sound standard including Sound Blaster, MPU 401, MT-32 and Windows Sound Systems
- 8 and 16 digital recording and playback from4kHz to 44.1kHz sample rate.
- Built-in CD-ROM interface supports Sony, Mitsumi, Panasonic and IDE.
- EasyStart installation.

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- DSP based wave table & FM synthesis combo sound board.
- 32 simultaneous stereo voice polyphony and General MIDI standard support with 128 instruments
- 2 MB of CD-quality sampled instruments sounds store in ROM
- Full Compatibility with all major sound standards including Sound Blaster, MPU 401, MT-32 and Windows Sound Systems.
- Built-in CD-ROM interface supports Sony, Mitsumi, Panasonic and IDE.
- Easy start installation.

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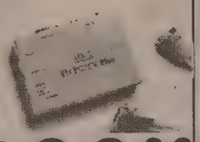

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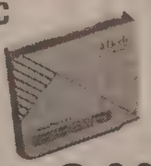

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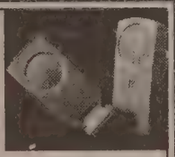

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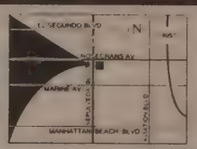

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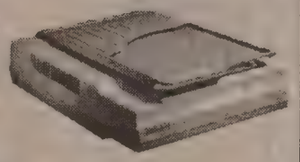

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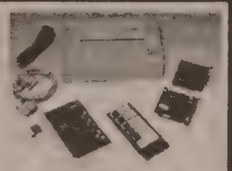

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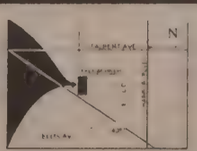

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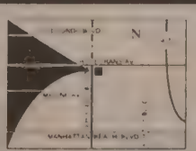

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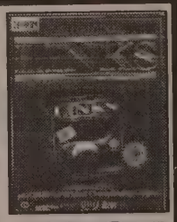

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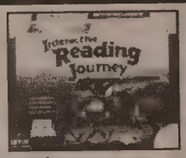

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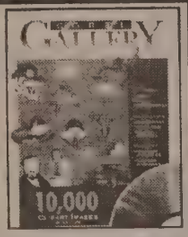

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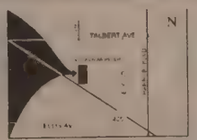

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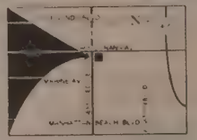

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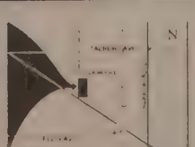

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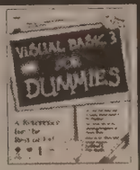

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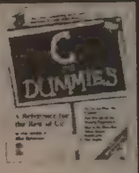

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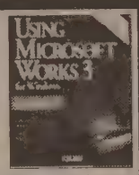

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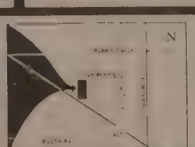

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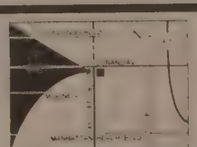

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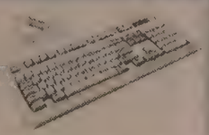

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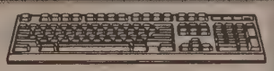

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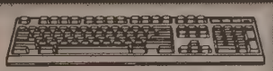

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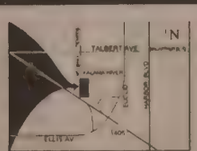

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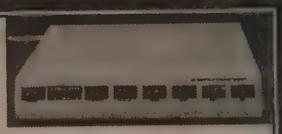

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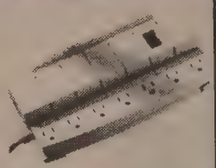

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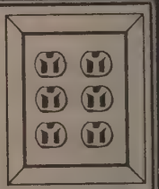

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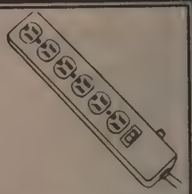

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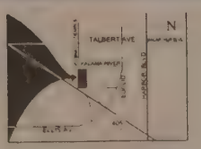

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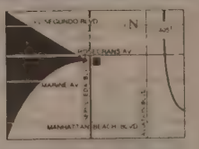

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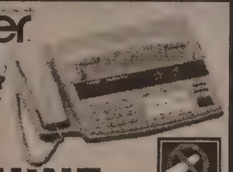

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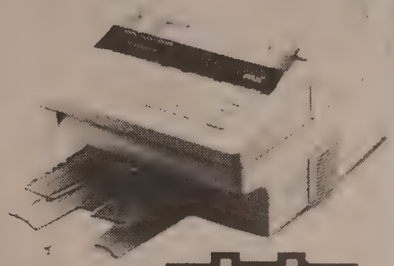

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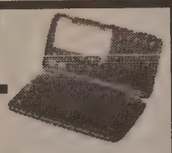

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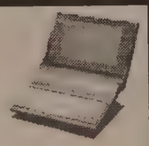

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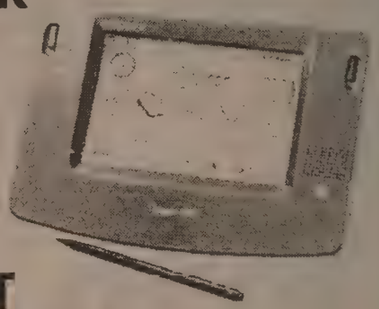

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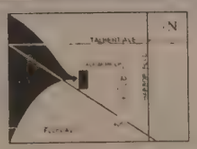

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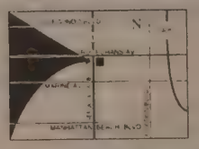

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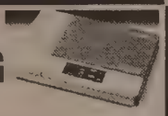

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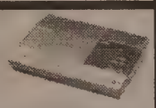
Panasonic DUAL MICRO CASSETTE ANSWERING SYSTEM

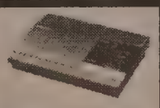


Panasonic's new dual micro cassette answering system offers an LCD Call Counter, marker message, room monitor, auto disconnect, electronic auto disconnect, electronic volume control, audible message alert, and much more for only...

$69.95

Model KX-T2100
#1740208

Panasonic DUAL MICRO CASSETTE ANSWERING SYSTEM
WITH VOICE TIME/DAY STAMP



Panasonic's new dual micro cassette answering system offers an LCD Call Counter, marker message, room monitor, auto disconnect, electronic auto disconnect, electronic volume control, audible message alert, and much more for only...

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Model KX-T2300
#1740219

Panasonic TWO LINE ANSWERING MACHINE
WITH VOICE TIME/DAY STAMP

Perfect for the home or office, this Panasonic two line answering machine offers voice time/day stamp, voice prompts, 2 variable greeting messages, room monitoring, message alert, call screening, auto interrupt, toll saver, and more. Now just...

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Model KX-T5300
#1768084

BUSINESS PHONES

Panasonic SPEAKERPHONE

For the office or home, this phone has all the features you need. It has a speaker phone, 28 station automatic dialer, automatic redial and much more.

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Model KX-T2315
#1530100

Panasonic TWO LINE SPEAKERPHONE

A perfect compliment to your home or office, this two-line speakerphone comes equipped with 3-way conferencing, 20 number programmability, seperate ring switches for each line, and a local mode function. Now only...

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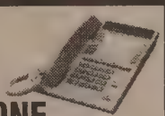
Model KX-T3120
#1510676

Panasonic 2-LINE SPEAKERPHONE
WITH LCD DISPLAY



From Panasonic comes this fully featured 2-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 24-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

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Model KX-T3175
#1745122

Panasonic THREE LINE SPEAKERPHONE
WITH LCD DISPLAY

From Panasonic comes this fully featured 3-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 48-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

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Model KX-T3185
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10 CHANNEL CORDLESS PHONES

Panasonic 10 CHANNEL CORDLESS PHONE

Most cordless phones have a very short battery life, but this one can last up to 10 days in the standby mode! Add a flexible antenna, 10 number memory, 10 channels, paging and you have an excellent value at...

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Model KX-T3712BK
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Panasonic 10 CHANNEL CORDLESS PHONE
WITH QUICK CHARGE & SECURE GUARD SYSTEM

Panasonic has developed the latest in cordless technology by incorporating a Quick Charge system that will enable you to recharge its battery in one hour providing 7-day standby or 3 hours providing 21-day standby! The Secure guard system can help keep your conversations private and help prevent eavesdropping scanners or baby monitors. Other features include one paging, 10 number memory, last number redial, flash, auto security code settings and much more for only

$118.95

Model KX-T3940
#1820915

Panasonic 10 CHANNEL AUTOSCAN CORDLESS DUAL KEYPAD SPEAKERPHONE
WITH SECURE GUARD VOICE SCRAMBLING

Panasonic's comes equipped with secure guard which scrambles your voice when others try to listen in on your conversations with other cordless phones, radios or even scanners! Other features include quick charge technology enabling to fully charge the battery in only 3 hours for 21 day standby, 2-way paging, intercom, 10 number memory, high gain, antenna, and much more. All for only.

$159.95

Model KX-T3965
#1886160

Panasonic 10 CHANNEL CORDLESS SPEAKERPHONE
WITH DUAL MICROCASSETTE

This top of the line cordless dual microcassette answering system with sound charger technology delivers sound so clear, you will hardly believe your ears! Some of the features included are: 2-way paging, intercom, auto security system, message alert, 2-way and memo recording just to name a few. Now only

$199.95

Model KX-T4400
#1803456

FAX MACHINES

Panasonic FAX MACHINE
WITH PAPER CUTTER, SPEAKERPHONE AND ALL DIGITAL ANSWERING MACHINE

Panasonic line of fully featured fax machines start with this compact model which includes 64 level grayscale, super thermal paper compatible, paper curl reduction, 164' paper roll capacity, 15 page document feeder, distinctive ring, delayed transmission, paper save mode, telephone directory with alpha-search, 12 station one-touch with 28 station speed dialing, and much more. All for just ..

$349

Model KX-F750
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Panasonic PLAIN PAPER FAX MACHINE
WITH 20 PAGE MEMORY

The ultimate plain paper fax from Panasonic features a jumbo LCD display, 70 page paper cassette, adjustable letter/legal tray, 32 level halftones, polling, activity reporting, 20 page document feeder, broadcasting to 128 locations, fax transfer, enlargement and reduction copier functions, fax/tel switch, 28-station one-touch dialer, 100-station speed dialer, telephone directory with alpha-search, and much more! Now just.....

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Model KX-F3000
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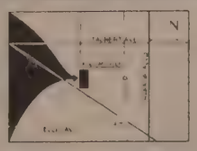

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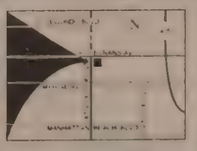

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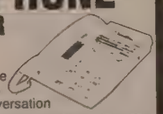
SPEAKERPHONES

BELL Phones

SPEAKERPHONE WITH 13 NUMBER MEMORY



The convenience of a handsfree speakerphone allows you to do other tasks while having a conversation on the phone. Features include 13 number memory, auto redial, mute, flash, and more. An excellent addition to any home or office at only...

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Model 4350
#1917518

SONY.

SPEAKERPHONE WITH 32 NUMBER MEMORY

From the leader in cordless phone technology comes a new line of feature phones. This unit has a crystal clear speakerphone, 32 number memory and more!

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#1516878

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TWO LINE FEATURE PHONE WITH SPEAKERPHONE

Phones with 2-line operation are relatively common, but this phone offers a distinctive ring for each line! The LCD indicator will tell you the number dialed and the time. Now only..

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Model IT-D250
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MULTI-LINE PHONES

BELL Phones

TWO LINE PHONE

Perfect for the home office with multi-line needs, this 2-line phone from Northwestern Bell features line-in-use LEDs, 3-way conferencing, 15 number memory, hold, flash, pause, and ringer controls. An excellent value at...

$39.99

Model Easy Touch 2202
#1890905

Panasonic

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$69.95

Model KX-T3110
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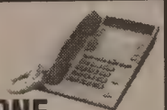
Panasonic

TWO LINE SPEAKERPHONE WITH LCD DISPLAY



From Panasonic comes this fully featured 2-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 24-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

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Model KX-T3175
#1745122

AT&T

THREE LINE SPEAKERPHONE

AT&T's multi-functional centrex compatible 3-line speaker -phone comes equipped with page, intercom, 3-way conference, LCD display, 40 number memory, auto line selection, hold, do not disturb function, auto-redial, mute program-mable pause, call transfer, flash, seperate ringer controls, and more, all for only....

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Model 843
#1853892

ALL DIGITAL ANSWERING MACHINES

AT&T

ALL DIGITAL ANSWERING MACHINE

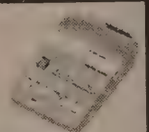
This AT&T answering system utilizes tapeless digital technology to ensure consistent recording quality over the life of the system. The convenience of new message play-back, outgoing message bypass, remote system turn on or off and remote message recording makes this an excellent value at only...

$69.95

Model 1710
#1853906

BELL Phones

ALL DIGITAL ANSWERING MACHINE WITH TIME DAY STAMP & 13 MINUTE CAPACITY



This fully featured all digital answering machine from Northwestern Bell comes equipped with Time/Day Stamp, Programmable Security, Selective Skip or Erase, Call Screen, Extension Pickup, Auto Disconnect, Multiple Memo Record, Toll Saver, VOX, 13-Minute Capacity, Remote Access, and much more! An incredible value at just...

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With three mailboxes to choose from, members of the household can have messages stored for them in their own mailbox! The all digital capability eliminates the need for moving parts and allows for instant playback of incoming messages-no need to wait for a tape to rewind or fast forward! Other features include voice time/day stamp, two outgoing messages, digital counter, selective message erase and much more for only...

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Model 2-9876
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AT&T

10 CHANNEL CORDLESS SPEAKERPHONE WITH 26 MINUTE CAPACITY & ALL DIGITAL ANSWERING MACHINE

From AT&T the leaders in telecommunication technology comes this state-of-the-art 10 channel cordless speakerphone with 26 minute capacity All Digital Answering Machine. With features that include 2-Way Page and Intercom, Hold, Last Number Redial, Time/Day Stamp, Multiple Outgoing Announcements, Voice Prompts, Digital LED Message Display, Call Intercept, Call Screening, and much more. AT&T has developed an invaluable addition to any home or office for just...

$249

Model 5650 #1919543

900 MHz CORDLESS PHONES

uniden

40 CHANNEL 900Mhz CORDLESS PHONE

Uniden's latest 900MHz cordless phone gives you unparalleled range and performance along with premium features that include 40 channel selection, call monitor, 2-way/hands-free intercom, 10 number memory, mute, last number redial, flash, and much more, all for just....

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Model EXP-901
#1965005

GENERAL ELECTRIC

100 CHANNEL AUTO SCAN 900 MHz CORDLESS PHONE

By combining 100 channel auto scan (which allows the phone to lock-on-to the channel that is getting the clearest signal) and 900 MHz crystal clear technology (for improved clarity and extended range), GE has developed the ultimate cordless phone! Other features include 10 number memory, page/find from base to handset, handset volume control, distinctive ring, and more. An excellent value at....

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Model 2-9910
#1923425

AT&T

DIGITAL 900MHz DUAL KEYPAD CORDLESS SPEAKERPHONE

AT&T, the leader in digital telephone technology once again leads the way into the future with the introduction of this 900MHz cordless phone. By operating at the 900 MHz frequency range rather than the conventional 46 to 49 MHz range, this AT&T cordless phone will provide clearer transmission with less noise and interference from other electronic devices, as well as extended range performance! Features include 10 number memory, mute, hold, flash, last number redial, one-way paging, out-of-range-indicator, digital voice encryption, and much more for only..

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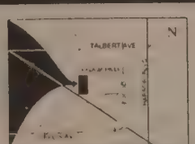

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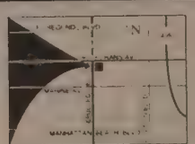

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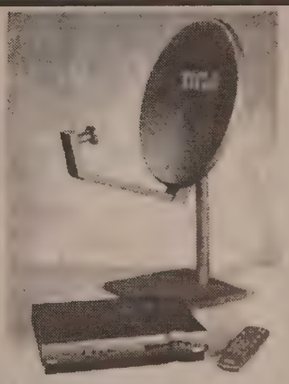
RCA DIGITAL SATELLITE SYSTEM (DSS) DISH AND RECEIVER



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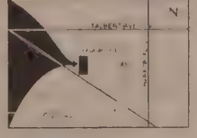

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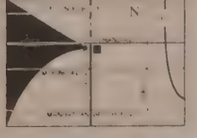

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Software Invaders, Pentium Bugs, And Other Modern-Day Hazards

By David Morgenstern

This month we bathe in the glory of corporate screwups as well as a warning to be on the lookout for a possible programmatic intruder. Put on your sunglasses.

"Little troubles are really not so bad—for someone else," said Sholem Aleichem, sometimes called the Jewish Mark Twain. But in the realm of computers, "little" takes on a new meaning. It's hard to grasp the concept when the building blocks are sub-microscopic, and the data stream is electronic. But users don't look at the detailed blueprints of our silicon architecture. Users want computers to do what they do best—the digital stuff, the finger work, er... calculations.

Unfortunately for the users that are required to clean up an input-output mess, the results of messy calculations are huge, even when only involving the smallest fraction. We expect a lot from our computational buddies, but an error is an error.

Our world is a tough place to find perfection; it's a rare commodity in machines or human beings. Take as an example the difficulties surrounding International World Standards Day.

In most countries, the day is celebrated on October 14. However, in the United States we observe it on the 11th, in Finland on the 13th. Italy needed a byte longer and held its conference on the 18th. Someone should take a stand on this! Perhaps a handstand.

Trojan Horse Sense

In early December, a warning went out over the Internet about a possible new Trojan Horse program. Like their more intelligent cousin, the computer virus, Trojan Horse programs can cause serious damage to a user's system.

Trojan Horses are software hand grenades that explode upon activation. They usually perform some negative action like formatting your hard drive or changing the names and creation dates of all your files! The programs almost always have an interesting name and usually toss up a slide show while they are proceeding with their dirty business.

The latest offender was reported on the America Online service and was called Good Times. Just as with the blasting cap tempting children in the sand lot, follow the wise saying: If you see one don't touch it. Or download it.

Many people mistakenly refer to Trojan Horses as computer viruses. The difference between the two is great. A virus has the ability to replicate itself and uses many schemes to spread itself from disk to disk or across networks. Their destruction is most often caused as a by-product of their writing themselves willy-nilly around your hard drive.

On the other hand, Trojan Horses are more simple, and spread themselves only by the unwitting help of their victims. But often their action is more sudden and destructive than that of viruses.

The only virus to make the scene this past year was INIT 9403 virus, that surfaced in Italy last March. It broke the rule and erased or messed up connected drives. Fortunately, it only worked under the Italian version of the Mac operating system.

All Mac users, and really all computer users, should run some form of anti-virus program. One of the best for the Mac is Disinfectant, which is free! The latest version is always available on the Utility V1 floppy disk from the BMUG office for $3 plus $4 shipping and handling, or from BMUG's membership online service, Planet BMUG.

The Error Of Bad Tidings

It's time for our Scholastic Aptitude refresher. Remember the word, *Schadenfreude*? It's a German term that refers to the malicious joy we feel when something bad happens to somebody else. It's the root of slapstick comedy and burlesque—the smile that comes to our mug when the pie splashes over the bride at the wedding banquet, or watching someone else, for a change, having to deal with a fool.

So what does this byte of language instruction have to do with computers? Hello, Intel!

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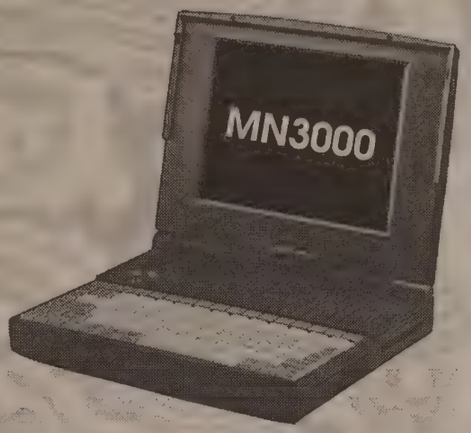

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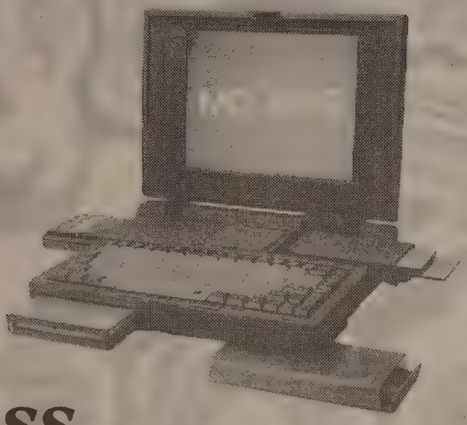

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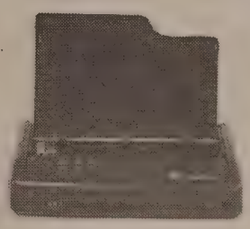

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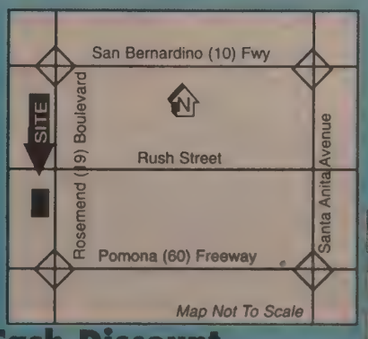

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Columnist, Jim Warren
Realizable Fantasies

NEW

FROM THE PLAYBOY FOU

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October 14 1993

Contact:

COMPUTER COLUMNIST AND OPEN GOVERNMENT ACTIVIST JIM WARREN
TO RECEIVE 1994 HUGH M. HEFNER FIRST AMENDMENT AWARD

Computer columnist and open government activist Jim Warren has been selected to receive the Hugh M. Hefner First Amendment Award in the category of government, the Playboy Foundation announced today.

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MICROTIMES salutes Columnist Jim Warren, winner of the 1994 Hugh M. Hefner First Amendment Award.

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Only if you were stuck in a coma for the past month could you have missed the great Pentium processor scandal. Scientists discovered that the chip had a flaw in its floating-point unit that caused an error when handling complex calculations. Sometimes.

The bug is definitely in the Pentium chip itself and not in system or application software. Instead of a correct number down to eight or nine decimal places, the chip, on rare occasions, chokes and comes in with a slightly false value.

Intel has made changes to the chip's Program Logic Array that fixes the math bug, but it will be a while before these reach users. Intel estimated that between half and two-thirds of the 5.5 million Pentium chips it will ship this year are flawed. There are additional problems with a souped-up version that can give problems when in a multiprocessing environment.

Although most users do not need such a high level of accuracy when balancing a checkbook or an ordinary spreadsheet, the problem has scientists alarmed. They need everything to be accurate down to the *n*th degree when measuring itsy-bitsy changes, as well as utterly reliable for long-term experiments. The Pentium problem may also give problems to the internal operation and calculations of math-intensive applications.

This news story was spread far and wide, from small-town papers to local television news reports. Reporters and news readers took a break from man-bites-dog and O.J.'s trial-of-the-century stories. It drove Intel stock down and zapped the entire techno-stock market for a while.

All of these problems are music to the ears of the PowerPC makers and Mac users. Can it be that there are some cracks in the Great Wall of Intel and Microsoft?

Some poor Mac users have had to wrestle management to be able to use a Mac in the office. Years ago at BMUG meetings, we would share stories of reverse-theft, hauling the Mac into the office at night through the back door. Macs have become big sellers in the academic, small office, desktop publishing, and now digital video markets. But the *Fortune* 500 market...

Users have had to push and push against some long-standing prejudices—that the Mac isn't "good" as a business machine; that it won't run this and that operating system; that it's just a "toy." Apple has tried to address these issues, but it's an uphill effort.

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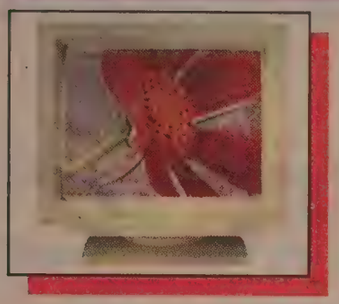

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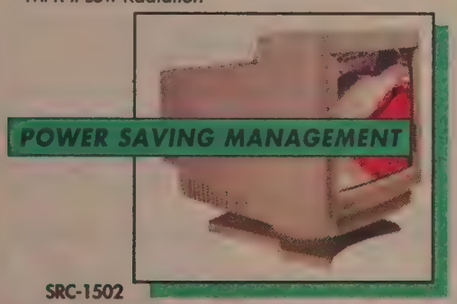

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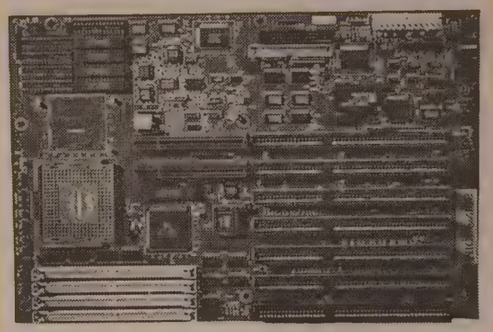

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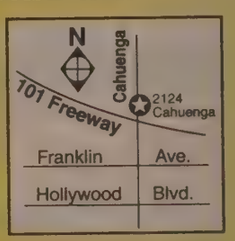

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BMUG Upcoming Events:

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January 5 Special Macworld Expo Meeting and Party Combo Blast at the Nikko Hotel ballroom, 222 Mason Street. Claris *ClarisDraw* and new stuff; Intuit new *Macintax* and *Quicken*; Connectix new *digital camera.*

January 12 Intergalactic Reality Galactomatic 1000 (data analysis); Now What Software *Small Blue Planet–the Cities Below* (cool CD atlas).

January 16 BMUG South at 1922 The Alameda, United Way Office in San Jose. Now What Software *Small Blue Planet–the Cities Below* (cool CD atlas).

January 19 Nisus *Nisus Writer 4.0* (word processing); Foresight Technology *FastPace Instant Contact* (PIM).

January 26 Microtech *ScanMaker IIsp* and DCR color calibration software; Nolo Press *WillMaker* and *Living Trust Maker.*

January 30 BMUG West at Exploratorium Science museum in San Francisco. Bit Jugglers *KidsWorld* (screen saver construction set).

Please Note: BMUG main meetings are held in 22 Warren Hall on the UC campus (near University and Oxford). Call the BMUG Announcement Line at (510)549-2684 ext. 8 for the latest news on meetings, special interest groups (SIGs), and seminars. See you there!

You could see the intensity of the fray at a recent BMUG meeting, when some members moaned over a recent rumor out of Japan on the possible first Mac clones. Bandai, a big Japanese toy maker, is reportedly going to go with the Mac operating system on a multimedia computer designed for kids. The new computer will use a special lightweight version of the PowerPC chip and will handle educational programs and games.

The members were not thrilled with this news! They felt that the announcement played along with the old stereotypes. Hey, kids are people too. Doesn't everyone deserve a chance at a really great computer interface?

The Pentium snafu creates a little psychological crack in the Intel/Microsoft marketing armor. It may put the small seed of doubt in the minds of management that may result in the Mac and future PowerPC-running computers getting a second look at evaluation time. What they need is a chance to prove themselves, instead of being simply dismissed out of hand.

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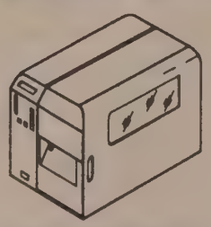

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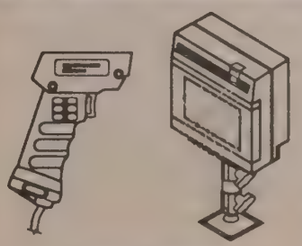

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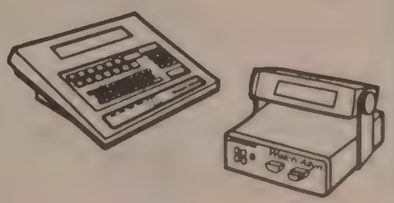

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Penti-yummy PR

The Net-based jokesters really outdid themselves with the fake press releases for the Pentium disaster. Here are a couple of the best:

•Pentium Blows November Election.

An anonymous source in the Democratic Party has revealed that the sweeping landslide victory of the Republicans in November may have been due to an obscure bug in the Intel Pentium computer chip.

Upgrading the nationwide vote-counting system to the latest technology was one of Vice President Al Gore's "Reinventing Government" initiatives. This change was meant to reduce costs and streamline operations, however, the computer glitch may have cost the White House dearly.

A spokesman for the Democratic Party denied the rumor that several thousand PowerPC computers had been purchased as part of a vote recount effort.

When questioned about the news, Senator Bob Dole (R) commented that he believed the Intel Pentium chip was far better than anyone had thought. A short statement released by Newt Gingrich's office indicated that "the Democratic party has always sought to divide America and that this discovery of a floating-point division bug in the Intel Chip was clear evidence of the moral decay of our society."

At a Motorola Plant in Austin, Texas, Ross Perot told an angry crowd that according to his new calculations the deficit is actually 14 times larger than the government has been telling us. He praised his staff for staying up all night and performing the calculations by hand.

In late-breaking news today, legal briefs were filed in Chicago by former senator Dan Rostenkowski's attorneys which claimed that the irregularities at the House Bank and the House Post Office were actually due to Pentium chip calculation errors.

Sources in Attorney General Janet Reno's office revealed a furious behind-the-scenes effort to reload the Whitewater investigation spreadsheets in order to double-check the results.

• Intel (NASDAQ: INTC) today announced a 3 for 1.99994562416 stock split effective Jan. 5, 1995, for stockholders of record as of Dec. 9, 1994. Although analysts were surprised about the strange ratio in the stock split, an Intel spokesman stated that "That's just the way the math worked out!"

Intel also filed a motion with the Securities Exchange Commission requesting that it be allowed to publish its financial reports to only 1 or 2 significant digits.

"There are significant efficiencies to be gained, both in the preparation and printing of financial reports. Just as taxpayers can choose to file returns using the whole-dollar method, we feel we can get financtal reports out much faster if we don't have to rerun all our spreadsheets through a PowerPC to verify them. Besides, most investors only care about the first 2 significant digits anyway!" the spokesman said.

In related news, Microsoft Corporation (NASDAQ: MSFT) announced that its chairman, Bill Gates, had filed for personal bankruptcy after discovering that his personal net worth had been overstated by approximately $8 billion due to an undisclosed computer glitch. ■

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continued on page 207

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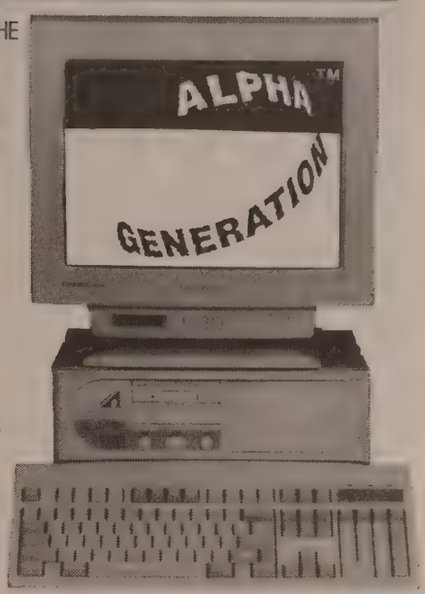

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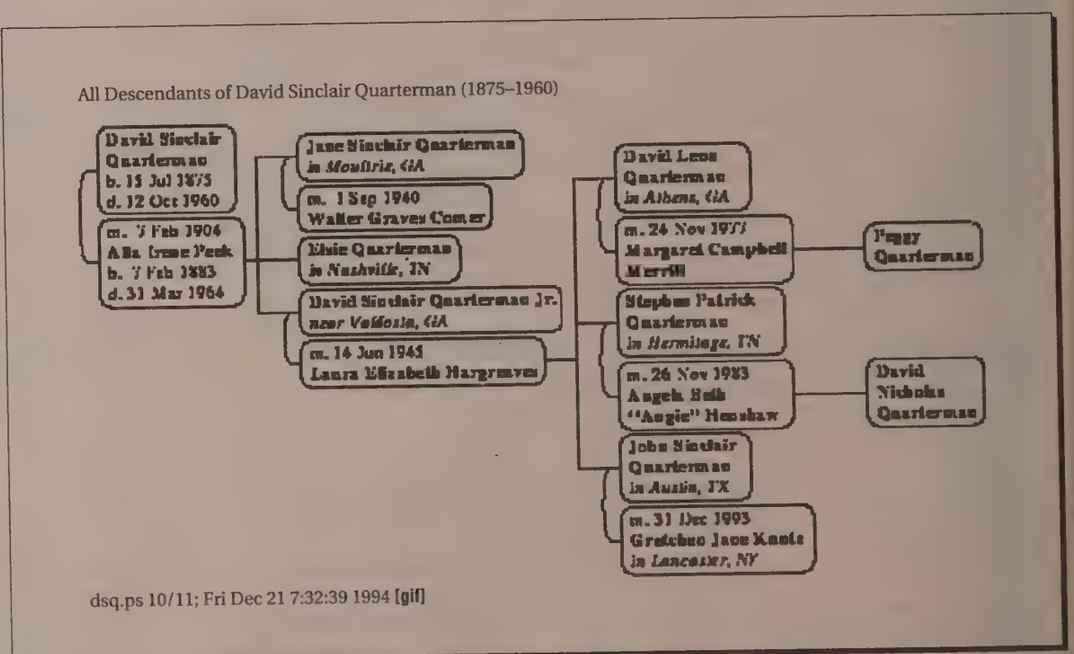
Family History On The Net

By John S. Quarterman and Smoot Carl-Mitchell

A few months ago we discussed distinctions between the Internet and the Matrix, and how various online providers and applications enter into the question. Let's look at a practical case that illustrates many of the points we made in that column.

Networks aren't just bits and bytes, and not all uses of them are academic research or for commercial profit. The Quarterman family uses them for a family history project.



Text: Aunt Elsie's Mailing List And Beyond

Aunt Elsie, in between reviewing botany textbooks, is transcribing letters written by our great-great-grandmother and some of her children around 1885. Elsie's first cousin, Helen the minister, had kept them until last year, when she chose to deposit them with us. Picking them up involved David Leon, John, and Gretchen driving six hours one November into the mountains of north Georgia. John later distributed photocopies by paper mail to everybody concerned. Elsie transcribes the letters on her PC in WordPerfect and mails them through her CompuServe account.

Elsie mails them to a mailing list that John set up on the TIC systems in Texas. Elsie's mail goes there and is automatically copied to John in Austin, Texas; to David Leon in Athens, Georgia; to Gretchen in Buffalo, New York; and to Patrick and Elsie in Nashville, Tennessee. DL, John, and Gretchen get their copies over the Internet, and Patrick and Elsie get theirs through CompuServe, but any of us can send a message to the list and all of us get it.

Aunt Jane, the leader of this project, isn't on the Net (yet), so we deliver her printed drafts, either in person or by paper mail. She wrote the 500+ page manuscript we started with, so she compares our current draft of the volume we're working on to her manuscript. She also adds new material she has found or has remembered personally; at 89 she is one of our most important primary sources, in addition to being the principal author. We pick up her annotated copy or she mails it to one of us, and we transcribe her editing marks. If she has put in questions for one of us who is online, we often send the question to the list so all of us can discuss it.

About every month or so, two or more of us get together in one place and discuss the project, among other things. The location varies, sometimes in Athens or Nashville, occasionally in Austin, often at the family farm near Valdosta, Georgia, or just about anywhere else, from Atlanta to Oxford. Elsie and Jane's brother David, who is DL, Patrick, and John's father, grumbles

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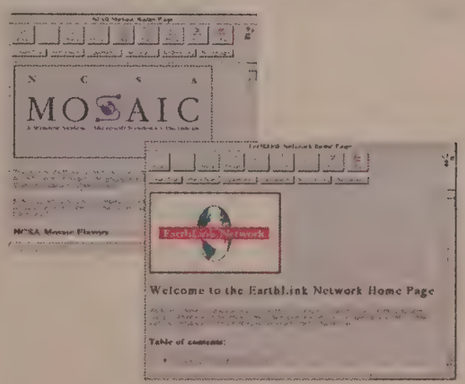

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about this project, since he's had to put up with it in one form or another for seventy years, but we don't let him off the hook, either. We deliver him drafts of the Quarterman family history book and transcribe his comments and his stories. He, like Jane and Elsie, is also a primary source, and it's interesting seeing where their stories match.

We use the telephone, too. We don't limit our communications to online media, but we do find those media to be of powerful benefit.

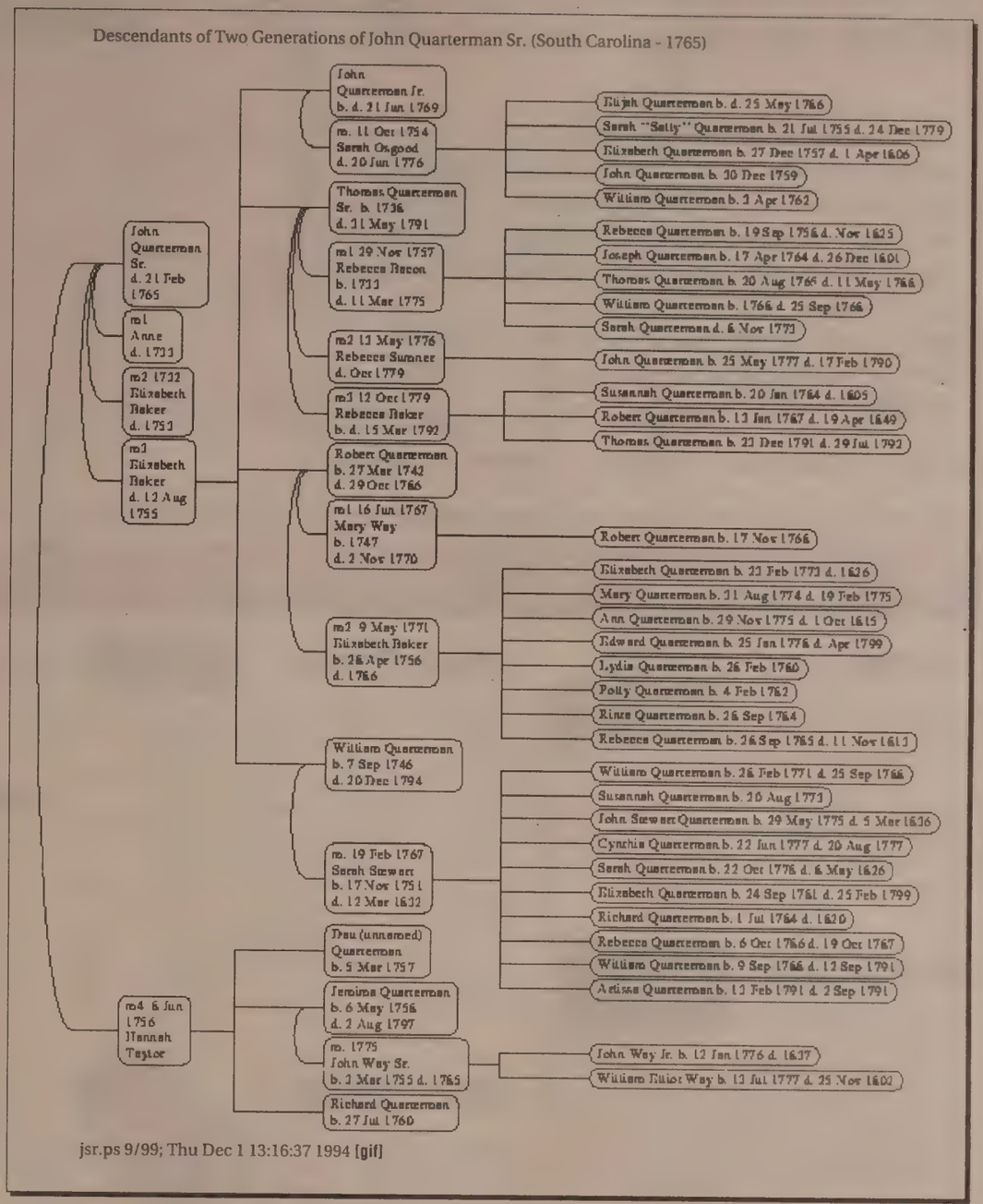
We also use our mailing list to inform each other of contacts and events. Our minister cousin Helen read a newspaper article about a man who seemed very likely to be a relative. She sent the article to her brother Clark in Valdosta, who showed it to John. John got the likely relative's telephone number from directory assistance and called it. His wife confirmed that he was indeed a relative, and had information on a whole branch of the family we had misplaced. He even has photographs, and he will send us copies.

Patrick's Photoshop

Patrick handles the photographs. He scans them on his flatbed scanner and uses Adobe Photoshop to adjust contrast, remove tears, and generally make them more presentable and get the most out of the available information. Jane has quite a collection of old photographs, from tintypes onwards. They are in varying states of preservation, since they passed through various hands at various times. Patrick has even managed to digitally stitch back together a newspaper photograph that was torn in half, and also to disguise the halftones so that it now looks like an actual photograph.

Patrick then encodes the results of all this photographic finessing in either TIFF or Encapsulated PostScript (EPS), or often both, and sends them to DL or John for inclusion in the book. This step is a bit tricky, since Patrick doesn't yet have Internet access for ftp and CompuServe charges a noticeable fee for mailing large messages; even compressed these pictures are pretty big. Sometimes he calls up one of our machines after the telephone rates drop and transfers the files with Kermit. More often he zips them onto a series of floppies and sends them by UPS.

Once we get the pictures, we unzip them into a directory on the machine that holds the master copy of the book. It's an i486 machine running BSDI that is usually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Robert Quarterman b. 13 Jun 1767 d. 19 Apr 1849
Thomas Quarterman b. 23 Dec 1791 d. 29 Jul 1792
Robert Quarterman b. 27 Mar 1742 d. 29 Oct 1766
m1 16 Jun 1767 Mary Way b. 1747 d. 2 Nov 1770
Robert Quarterman b. 17 Nov 1766
m2 9 May 1771 Elizabeth Baker b. 26 Apr 1756 d. 1786
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Cynthia Quarterman b. 22 Jun 1777 d. 20 Aug 1777
m. 19 Feb 1767 Sarah Stewart b. 17 Nov 1751 d. 12 Mar 1832
Sarah Quarterman b. 22 Oct 1778 d. 6 May 1826
Elizabeth Quarterman b. 24 Sep 1781 d. 25 Feb 1799
Richard Quarterman b. 1 Jul 1784 d. 1820
Rebecca Quarterman b. 6 Oct 1786 d. 19 Oct 1787
William Quarterman b. 9 Sep 1788 d. 12 Sep 1791
Artissa Quarterman b. 13 Feb 1791 d. 2 Sep 1791
m4 6 Jun 1756 Hannah Taylor
Dau (unnamed) Quarterman b. 5 Mar 1757
Jemima Quarterman b. 6 May 1758 d. 2 Aug 1797
m. 1775 John Way Sr. b. 3 Mar 1755 d. 1765
John Way Jr. b. 12 Jan 1776 d. 1837
William Elliot Way b. 13 Jul 1777 d. 25 Nov 1802
Richard Quarterman b. 27 Jul 1760
jsr.ps 9/99; Thu Dec 1 13:16:37 1994 [gif]

located in Athens. It's been known to take a side trip to Austin, but it's usually on the Internet in either location. Because it's on the Internet, either DL or John can log in on it by telnet and edit text files or the genealogical database, and format the book, from title page (*Families Helped Build America: The Quarterman Family of Liberty County Georgia and Allied Families*) to index.

Genealogical Databases And The Joys Of Transferring Large Files

The genealogical database is maintained with a program called LifeLines, which was written by Tom Whetmore. There's a mailing list about LifeLines, and we get the latest version of the program by ftp across the Internet. We use LifeLines to generate much of the source text of the book directly out of the genealogical database, and to generate hooks to include other text pieces, pictures, and genealogical charts. We format the book with LaTeX and TeX, producing PostScript output. The EPS version of the pictures is incorporated directly into the output PostScript, so the whole book can be printed as a single large PostScript file.

John and DL routinely transfer copies of the output PostScript book across the Internet between their machines; it's about 8MB compressed. Since the com-

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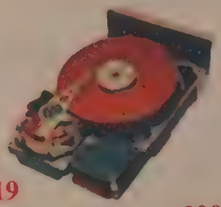

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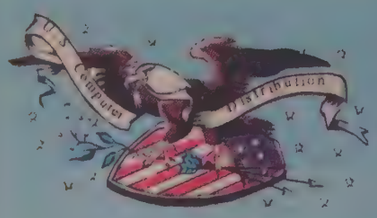

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puter with the database is usually in Athens, John often reformats the book through telnet to that machine, ftps the output to Austin (or Buffalo, or wherever he happens to be on the Internet at the moment), and uses a PostScript previewer such as Pageview, Ghostscript, or Ghostview to look at the results. This is quite convenient; we like to think of it as resource sharing as it was originally intended.

We've even indulged in a bit of distributed software development related to this project. DL and John have provided a few comments to Tom Whetmore in his development of the LifeLines program, as have many other people across the Matrix. Tom sometimes mails copies of the software, but most

Internet access is not just faster than mail-only access to the rest of the Matrix, Internet access is qualitatively different in large, clear, and important ways.

of us now pick it up by ftp. LifeLines users not only contribute directly to the development of the main database program. They also write report generator programs that work with LifeLines itself to generate reports ranging from lists of birthdate frequencies to tiny tafels (lists of surnames and dates that show when those surnames are of interest for a particular genealogical research project) to genealogical chart-drawing programs to the kind of report generator we use to produce the TeX source for the book.

We have written a report generator that draws descendant charts (see http://www.tic.com/~jsq/chart/) in a manner that we like. We tested this program on several different computer platforms across the Internet, using ftp to deliver it and telnet to run it.

Patrick, however, is still too far out on a limb of the worldwide Matrix of computer networks that exchange electronic mail to participate in this level of resource sharing. It would be very useful if he could see the formatted book online without waiting for DL to print a copy and mail it to him, especially considering that at seven hundred pages printing the whole thing has become non-trivial. But CompuServe doesn't permit telnet or ftp. We could uuencode the book into a large number of mail messages and send it to him that way, but he wouldn't like to pay the resulting CompuServe bill.

We can use LifeLines to write the genealogical database in GEDCOM format and send that to Patrick. That's much smaller than the formatted book, and GEDCOM is the genealogical information exchange format universally used by all modern programs of this type; according to its documentation it is "the GEnealogical Data COMmunication standard proposed by the Family History Department of The Church of Jesus Christ of Latter-day Saints, and adopted by many developers and users of genealogical software."

So Patrick can then examine the database, perhaps using The Master Genealogist (TMG) or Brother's Keeper or some other

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genealogical program that understands GEDCOM. But he can't format the book, unless he also gets copies of various ancillary Makefiles, shell scripts, etc. and essentially duplicates the environment on the master machine. Even then, he would have a duplicate, which leads to consistency problems between the two instantiations of the database that interactive remote access to a single master copy does not have.

Net Vs. Mail

So here you can see a practical illustration of the difference between what you can do with the Internet's interactive resource sharing protocols and what you can do if you only have electronic mail.

Sure, theoretically Patrick could send pictures by mail and we could send the formatted book back that way, but in practice it ain't gonna happen. And there's no way he could log in by mail onto the computer with the database and directly format the book and interactively examine the source files and the output. Internet access is not just faster than mail-only access to the rest of the Matrix, Internet access is qualitatively different in large, clear, and important ways.

Now, this is not to say that CompuServe does not have its advantages: it does. For example, there is a CompuServe genealogy forum, with participants in asynchronous conferencing from around the world. On that forum Patrick found a researcher in Maryland who helped us follow up a lead on some possible ancestors. He has also gotten software off of CompuServe that has been of use in his enhancements of the photographs, as well as advice on which techniques would be most useful. He says he got the most help from the mail various people send back and forth.

We've also found Prodigy useful, because another cousin has a Prodigy account, and he answers his mail. CompuServe and Prodigy have large audiences for conferencing and are useful sources of software and other files. But for a project such as this Quarterman family history that requires distributed access to remote computing resources, CompuServe and Prodigy are not practical; you can't use either one to log in on another subscriber's computer. And for frequent exchange of large specialized files, they're just too expensive, because they charge by size of transfer, not by bandwidth. For resource sharing you can't beat the Internet.

It will be especially interesting to see what happens with online genealogy now that people are starting to adapt genealogical databases to the World Wide Web. After all, few types of information are more adapted to hypertext: every family relationship is a potential Web link. It's already trivial to dump a GEDCOM database into a set of html files, one per person. This method provides only static links, however. Look for Web genealogy using a database engine like LifeLines to generate links on the fly. Some examples are already available; see http://www.tic.com/ gen.html . ■

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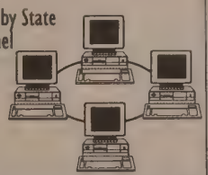

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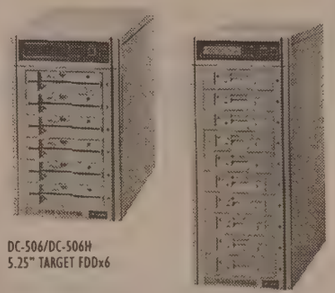

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Cyrix 486DLC-40MHz ISA 128K C. w/Math Co.	147
386DX-40MHz w/128K C.	97
386DX-33MHz w/4MB RAM Installed	197
386SX-40MHz	70

CD-ROM

Panasonic Double Speed CD ROM	'147
TEAC 4X Speed IDE CD ROM	327
Plextor 4X Speed SCSI CD ROM	537
16 Bit Sound Card	77

VIDEO

MGP	'15
VGA 256K 16 Bit	35
Trident SVGA 512K	45
Trident SVGA 1MB	61
Cirrus Logic VLB 1MB 32 Bit Video	77
Advanced Logic 2301 PC 1M	105
Cirrus Logic 5434 PCI 1MB	118
Tseng Lab ET4000 PCI 1MB	145
S3 Vision 864 PCI 1MB	147
ATI Wonder XL24 1MB	107
ATI Wonder Mach 32-D 1MB 16 Bit ISA	150
ATI Ultra Plus Mach 32-D 24 Bit 2MB ISA	185
ATI Ultra Pro Mach 32-Y 24 Bit 2MB ISA	255
ATI Wonder Mach 32-D VLB 1MB	137
ATI Ultra Plus Mach 32-D VLB 2MB	197
ATI Ultra Pro Mach 32-Y VLB 2MB	247
ATI Winturbo Mach 64-Y VLB 2MB	293
ATI Ultra Plus PCI Mach 32-D 1MB	137
ATI Ultra Pro PCI Mach 32-Y 2MB	270
ATI Winturbo PCI Mach 64-Y 2MB	317
Diamond Stealth 32 VLB 2MB DRAM	165
Diamond Stealth 64 PCI/VLB 2MB VRAM	299
Diamond Stealth 64 PCI 2MB DRAM	302
Diamond Stealth 64 PCI 2MB VRAM	299
Spider PC II 64 Bit VLB/PCI 2MB	175
Spider Tarantula 64bit PCI/VLB 4MB VRAM	425
AT I/O (2S,1P,1G) Ports	14
AT IDE (Dual HD/FD Controller) w/Cable	14
AT Super IDE w/I/O (Dual HD/FD Controller)	17

HARD DISK/TAPE BACKUP

1.2MB FDD (5.25")	'47
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420MB IDE (13ms)	195
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250MB Tape Backup Internal	149
350MB Tape Backup External	357
Conner 525MB SCSI 200kb/Sec	470
Sony 2GB Dat Tape Backup SCSI-2	767
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ALL SYSTEMS ABOVE INCLUDE:

- 4MB RAM of High Speed 70ns
- 1024 x 768 SVGA card
- 1.4MB Floppy Drive
- 1 Parallel, 2 Serial, 1 Game Port(s)
- 14" SVGA Color Monitor
- BTC 101 Key Enhanced Keyboard
- Desktop or Mini Tower Case w/Digital Display
- Serial Mouse

UPGRADES

VIDEO UPGRADE

• ATI Wonder Mach 32 VLB 1MB	'107
• Diamond Stealth 64 VLB 2MB	175
• Diamond Stealth 64 PCI 2MB	157
• ATI Ultra Plus PCI 1MB	115
• PCI 32 Bit 1MB Video	79
• PCI IDE HD Controller	19
• 32-bit SVGA VESA LB 1MB Video	38
• 32-bit IDE VESA LB Cntrl	15

HARD DISK

	420MB
• 540MB IDE HD	'50
• 730MB IDE HD	139
• 1.08GB IDE HD	319

MONITOR UPGRADE

• Masonic 14" N.I. 1024x768, .28dp	'65
• Shamrock 15" N.I. 1280x1024, .28dp	168
• Sony 15SF 15" N.I. 1280x1024, .25dp	319
• CTX 1760 17" N.I. Low Radiation, .28dp	487
• MAG DX-17 N.I. LCD Green, .28dp	510

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- 14" Non-Interlaced SVGA .28dp Green
- 101 Enhanced Keyboard
- Digital Medium Tower w/230PS
- FREE Microsoft Compatible Mouse

PCI 486DX2-66....$1199
PCI Pentium 66....$1595
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INTEL 486DX
VESA Local Bus
- Intel CPU
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- Built-in 80487 Math Co-Processor
- CPU Cooling Fan w/Heatsink
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- 32 Bit Local Bus Video w/1MB (Exp. to 2MB) (Resolution up to 1280 x 1024)
- 14" Non-Interlaced SVGA .28dp LR
- 101 Enhanced Keyboard
- Digital Medium Tower w/230PS

VL486DX-33 .....$895
VL486DX2-66 .....$955

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- 256K Cache, w/PCI, VLB & ISA Slots
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- PCI, Diamond or ATI w/1MB, Max. 16M Color, 1280 x 1024 Res
- 15" Non-Interlaced SVGA .28dp Digital
- 101 Enhanced Keyboard
- Digital Medium Tower w/230PS

PCI 486DX2-66 .....$1399
PCI Pentium-66 .....$1795
PCI Pentium-90 .....$1895

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- Built-in Math Co-Processor
- 16MB RAM, 70ns (Exp. to 128MB)
- 1.2MB & 1.44MB TEAC Floppy
- 1GB SCSI - 2 Fast Hard Drive
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- PCI, Adaptec 2940 SCSI Controller
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- 17" (MAG) MX17FG .26 SVGA
- Focus 2001 Keyboard
- Digital Full Tower w/250PS
- FREE** Microsoft Serial Mouse

PCI 486DX2-66 .....$2745
PCI Pentium-66 .....$3145
PCI Pentium-90 .....$3245

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COMPONENTS

Memory:	
1MB SIMM, 70ns	$40
4MB SIMM, 70ns	$145
Vesa Local Bus Motherboard:	
256K Cache, 3VLB, ZIF, Green, AMI BIOS	
• board only w/o CPU	$90
• with Intel 486DX-33	$215
• with Intel 486DX2-66	$275
PCI, 486DX2-66 Intel CPU	$335
PCI, Pentium 66 Intel CPU	$715
PCI, Pentium 90 Intel CPU	$800
PCI/VLB IDE + IO	$25/$15
PCI/VLB Windows Acc. w/1MB	$95/$55
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270MB/540MB SCSI Hard Drive	$195/$255
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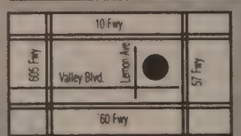

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MOSAIC & NETSCAPE *continued from page 120...*

there. The software that we export adheres to that limit.

Inside the US we can do anything we want in terms of how strong to make the encryption, so we are making the encryption very strong using very long key lengths, 128-bit RC4, which is virtually unbreakable using any technology projected out for the next ten or twenty years.

This puts you in a situation of having one hand tied behind your back, especially in competing with European vendors.

There is no question that we are hampered in competing with companies outside the United States that will be able to bring to market stronger forms of encryption. It puts us at a huge disadvantage.

Today Netscape Comm. is announcing its latest agreement, this one with Bank of America. Can you tell me about it?

They are participating with us in making it easier for businesses and consumers to do real live commerce over the Net. I don't think this is the final draft, but the quote in here is:

> "We researched payment options available for the Internet and found Netscape Communications is providing the fastest, most secure, and most open environment for online payment processing. Other payment options on the Net come with high transaction risks, bypass bank payment systems, and open the way to fraud and consumer liability. This approach eliminates those concerns and allows companies and consumers to feel comfortable and confident conducting business on the Internet." (Sharif Bayyari, senior vice president of Bank of America)

That sort of sums up what we've been trying to do. With relationships like this we, in collaboration with companies like Bank of America and First Data, can offer businesses the ability to put up services that people can go to and then let those people engage in commerce over the Net without having to worry about any of the risks and without having to go through any particular amount of overhead to do it.

One of your other big announcements was with MCI and its internetMCI service. Is this part of bringing the Internet the last mile into the home?

This is a couple different things. The announcement they made is fairly broad based. It is mainstream Internet access with 400–450 points-of-presence on the MCI network as well as providing direct Internet feeds to their business customers, such as T-1 or frame relay connections. But even more than that, they took a very broad view of the concept of Internet service. With internetMCI and marketplaceMCI they are trying to enable an environment for commerce to take place. There are quite a lot of higher-level services they want to offer on top of this basic infrastructure.

We are integrating their back-end system for marketplaceMCI, along with front-end software, the more vanilla server software, and security approaches. This in turn ties into the credit card clearing and other financial work that we are doing. The object is not that MCI is the only game in town. But companies like MCI are able to offer very broad-base, very efficient, very economical service and really start to make this whole environment more broad based.

For a lot of the existing Internet service providers, who have historically been fairly small and often geographically isolated, this is not necessarily a wonderful announcement. But at the same time this should mean that access to the Net for everyone will be more widespread and much easier to set up. I also think in the long run access is going to be much cheaper.

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PENTIUM PCI SCSI
GIGABYTE SYSTEM
CASH PRICE

Pentium 90MHz.....$2569
Pentium 66MHz.....$2319
Pentium 60MHz.....$2198
486DX2-66MHz.....$1959

- Intel Pentium Processor
- Pentium PCI Motherboard (US made)
- 4 PCI, 5 ISA Slots
- 256K Cache
- 16MB Fast Ram, 72pin Access
- PCI SCSI II Controller
- 1.0GB SCSI II Hard Disk
- 1.44 Floppy Disk
- ATi Mach 64 PCI 2MB VRAM
- Mid Tower w/230W UL
- 101 Enhanced Keyboard
- Microsoft Mouse
- No Monitor

UPGRADE:

ViewSonic 17".....+$799
Nanao F760iw.....+$1850
2.0GB.....+$600

PENTIUM/486 PCI
MULTIMEDIA SYSTEM
CASH PRICE

Pentium 90MHz.....$2209
Pentium 66MHz.....$1954
Pentium 60MHz.....$1879

- Intel Pentium Processor
- Pentium Motherboard
- 4 PCI, 5 ISA Slots
- 256K Cache
- 8MB Fast Ram, 72pin Access
- PCI IDE Enhanced Controller
- 540MB Hard Disk
- 1.44MB Floppy Disk
- ATi Mach 64 PCI 2MB DRAM
- 15" Green, .28 NI 1280x1024
- Flat Screen, Digital Control, EPA Energy
- Mini Tower w/Digital, UL Approved
- 101 Enhanced KB & High Res. Mouse
- Multimedia Kit I (Listed Below)

UPGRADE:

1.0GB IDE.....+$275

GREEN VLB SYSTEM
CASH PRICE

486DX2-66MHz.....$1149
486SX-33MHz.....$1009
486DX-33MHz.....$1139

- 486 DX/DX4, D.Green MB
- ZIF, AMI Bios
- 256K Cache Upgradable to 512K
- 8MB RAM 72pin Access
- VLB IDE Controller
- 420MB HDD
- 1.44MB FDD
- 32 Bit VLB SVGA 1MB, 16M Color
- 14" 1024x768, .28dp SVGA Monitor
- Mini Tower Case w/Digital Display
- 101 KB Enhanced Keyboard
- Hi-Resolution Mouse 800dpi

UPGRADE:

ATi Mach 64 2MB DRAM.....+$100
15" Digital, 1280x1024, .28dp, N-I+$150

GREEN 486 PCI SCSI
MULTIMEDIA SYSTEM
CASH PRICE

486DX2-66MHz.....$1889
486DX-33MHz.....$1869
486DX4-100MHz.....$2279

- Intel 486 Processor
- 486 Motherboard
- 4 PCI, 5 ISA Slots
- 256K Cache
- 8MB Fast Ram, 72pin Access
- PCI NCR SCSI II Controller
- 540MB SCSI II Hard Disk
- 1.44MB Floppy Disk
- ATi Mach 64 PCI 2MB DRAM
- 15" Green, 1280x1024, .28 NI
- Flat Screen, Digital Control, EPA Energy
- Mini Tower w/Digital, UL Approved
- 101 Enhanced KB & High Res. Mouse
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- NEC 3x Speed SCSI CD ROM
- 12 S/W Titles, Includes Grolier's Encyclopedia, Animals & Many More!
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486DX-33MHz.....$1219
486DX4-100MHz.....$1629

- Intel 486 Processor
- 486 Motherboard
- 4 PCI, 5 ISA Slots
- 256K Cache
- 8MB Fast Ram, 72pin Access
- PCI IDE Controller
- 420MB Hard Disk
- 1.44MB Floppy Disk
- PCI SVGA Adapter 1MB Win. Accelerator
- 14" SVGA Monitor 1024x768, .28
- Mini Tower w/Digital, UL Approved
- 101 Enhanced KB & High Res. Mouse

UPGRADE:

ATi Mach 64 2MB DRAM.....+$100
15" Green, 1280x1024, .28 NI.....+$145
1.2MB Floppy.....+$45

SAVINGS FOR 1995!

GREEN 486 VLB
MULTIMEDIA SYSTEM
CASH PRICE

486DX2-66MHz.....$1479
486DX-33MHz.....$1439
486DX4-100MHz.....$1890

- Intel 486 Processor
- 486 Motherboard
- 3 VLB, 4 ISA Slots
- 256K Cache
- 8MB Fast Ram, 72pin Access
- VLB IDE Controller
- 420MB Hard Disk
- 1.44MB Floppy Disk
- VLB 1MB Windows Accelerator Upgrade to 2MB
- 15" Green, 1280x1024, .28 NI
- Flat Screen, Digital Control, EPA Energy
- Mini Tower w/Digital, UL Approved
- 101 Enhanced KB & High Res. Mouse
- Multimedia Kit I (Listed to Right)
- Sound Blaster 16 MCD

MULTIMEDIA KIT I
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16bit Sound Blaster MCD 16
2x Sony CD ROM
12 CD Titles Includes Grolier's Encyclopedia, U.S. /World Atlas & Many More!
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2w/Speakers

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PCI Diamond Stealth 2MB.....145
VLB Diamond Stealth 2MB.....130
VLB S3 1MB Win. Accelerator.....80
VLB Trident 9400CXi.....65

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21" Nanao F760iw.....$1875
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15" KFC 1507 Digital, Green.....310
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14" Green SVGA .28dp NI.....245

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420MB IDE.....195
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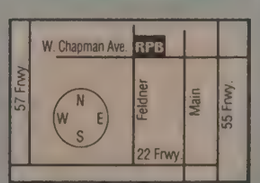

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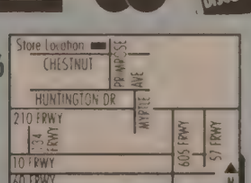

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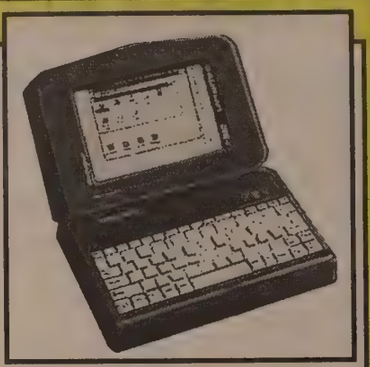

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6 MB RAM, Ethernet, Math Co-Processor ..... *CALL

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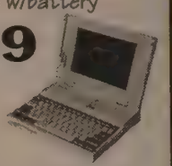

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Active Color	486DX4-100	520MB	$CALL
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Mono.	486DX2-50	340MB	$CALL
Mono.	486DX2-50	260MB	$CALL

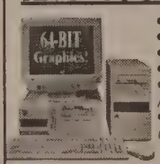
SYSTEM SPECIALS

IBM PS/2 ISA 486 50 MHz

- 4MB RAM
- 160 MB HD
- Keyboard
- 3.5" 2.88 FDD
- DOS • Mouse
- SVGA Card
- Serial/Parallel

$599

IBM 486 75 MHz



- 4MB RAM
- 420 MB HD
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- Mouse • SVGA Accelerator VLB
- 2-VLB Slots

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- DOS • Windows
- 1MB SVGA Card
- Keyboard
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PS/2 • 386 • 4MB RAM
• 60MB HDD
• Case

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IBM 386

PS/2 • 386 • 2MB RAM
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Major Manufacturer

486 DX2-66MHz

Pentium Upgradable

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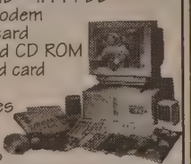
- speakers
- 12 CD Titles
- Keyboard
- Mouse
- DOS 6.2.2, Windows, PFS Works, WinFax and Prodigy
- FCC Class B, UL, CSA



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- 80MB HD
- 1.44 FDD

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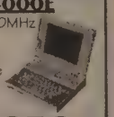

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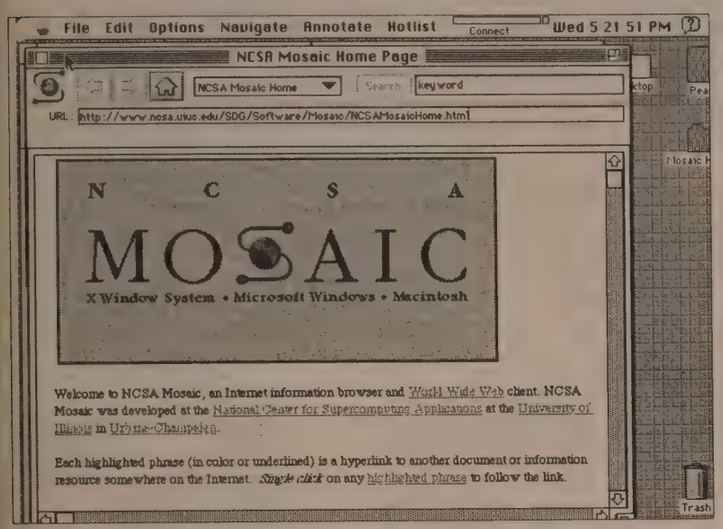
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MOSAIC
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Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in Urbana-Champaign.
Each highlighted phrase (in color or underlined) is a hyperlink to another document or information resource somewhere on the Internet. Single click on any highlighted phrase to follow the link.
Trash

NCSA Mosaic joined the power of the World Wide Web with a graphical interface to launch the latest wave for computer networks.

Companies that actually control the wires, that own the networks, are going to have an edge over companies that buy time on the wires from those same infrastructure companies to provide services. But for the Net to keep expanding and to become an enduring piece of the national infrastructure, a lot of these things have to happen. There has to be nationwide access. There has to be mechanisms for businesses to feel safe and secure. There has to be much higher bandwidths.

Since the Net is international, how do Netscape and Netsite deal with other languages and systems?

Our products will be fully internationalized in the 1995 time frame. It is not only a huge market, exploding in Europe and particularly in Japan, but there is no reason for English to be the only language that is out there.

How does it handle non-Romanic languages?

Not very well. We are doing the work that is required for 16-bit character sets and localization.

At this point are characters bit-mapped? How did Mosaic handle equations and scientific symbols?

It didn't at all. It just let you throw up images. In fact that is what you can do today. If you go out on the Net you will see documents in Japanese or Korean, they are just images.

There is nothing that we do that rules out doing, for example, wide character sets other than the fact that in Mosaic the code was just not there. In Netscape it is not there yet, but it will be soon.

Finding things has been a long-standing problem on the Internet. How do you see this changing?

You will notice when you start up Netscape you get a row of buttons. We thought this would be an interesting thing to experiment with. You are able to click on a button, go to a directory, and do a search. Today, and this is characteristic of the Internet, we point to lots of different directories. So your first problem is which directory do you want to use, but you then go out from there.

This reflects something interesting about the environment. The Net is not centralized. It is absolutely chaotic, absolutely out of control. That is one of the

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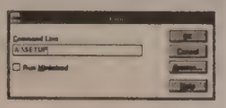
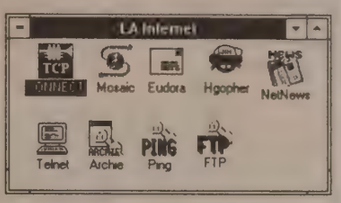


3. **CLICK HERE.** → *And cruise ...*



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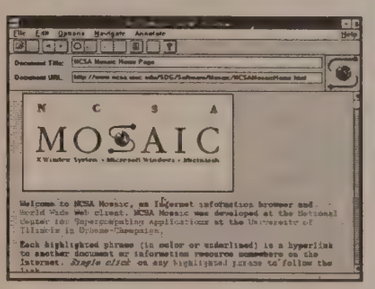

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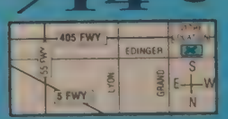

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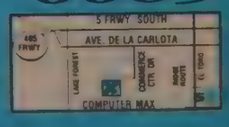

great things because nobody is constraining anything that goes on there. There can be a wide variety of ways to organize and find things. I think that over time that is going to be a service that people are going to be able to offer, particularly in the new Internet where people will be able to offer that as a value-added service. It will be a business of providing indexes. Vannevar Bush predicted this forty or fifty years ago. There would be people called Trailblazers whose specialties would be sifting through the global information space and finding all the interesting things. Charting new trails through the hypertext. I think that is going to be an interesting business to be in at some point.

What do you see as the threats to Netscape Communications? Is it the competition doing things better or will it be a totally new scenario or technology?

It is going to be an interesting trade-off over the next few years. With the market growing as rapidly as it is, it is hard to differentiate between competition and somebody else doing something to grow the market even more. A lot of what the other companies are doing, including companies like EIT, is not only complementary but probably very beneficial to us because it is growing the environment. We will see what happens over the long term. There is no question the software is fiercely competitive, overall. But in a phase of rapid growth like this there are lots of opportunities for lots of people.

In the beginning of this you mentioned that one of the goals with Mosaic and Netscape was to pull together all the resources of the Net. With the growth of a variety of server technologies, client software, and the development of information access roadblocks or toll bridges, do you foresee the Net fragmenting?

Those are not roadblocks. That's a new road that wasn't there before. That service would simply not be there if there wasn't a way for them to charge for it. When you have an environment where all information is free, you get a lot of worthless information. You get a lot of interesting things happening—community spaces, lots of people interacting. But as far as information spaces go, it is mostly landfill. What's happening with the ability to charge is that the diversity of resources available is expanding, and will continue to expand. If you want to be a traditional user of the Internet and not pay tolls, then you don't access those resources, but they wouldn't have been there anyway. The fact that they are there and there is this business that can be built around them means that the entire Net benefits because the infrastructure itself grows. So you win either way. ■

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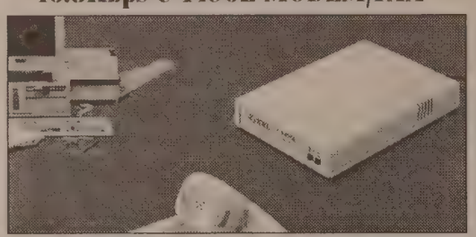

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PC Digest RATINGS REPORT — May 1993: ZyXEL U-1496, ZyXEL U-1496E

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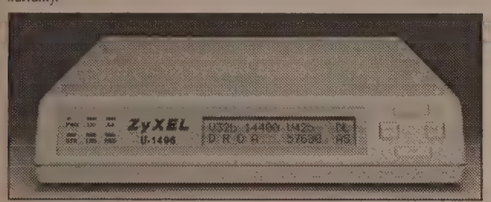

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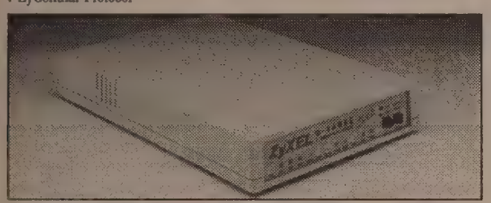

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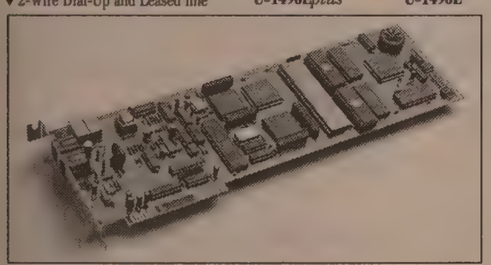

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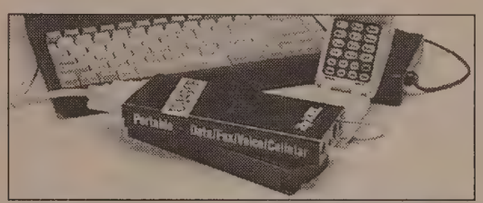

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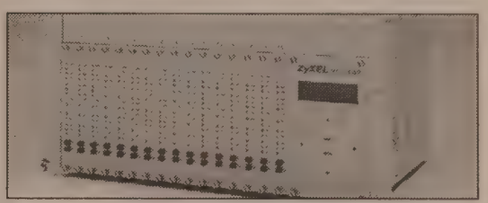

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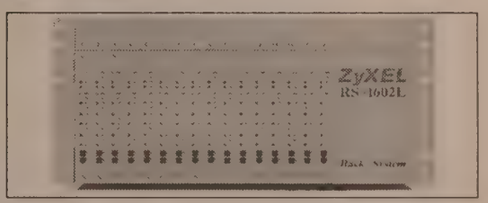

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- Permits Hot-Swapping of Modem Cards
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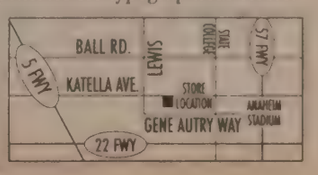

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Accounting *continued from page 60*

at least equal the cost of the raw software ingredients.

Although shrink-wrapped, store-bought software is taxable, the regulations provide a surprisingly generous loophole. The sale of a prewritten program is not a taxable transaction if you transfer the program by modem from your place of business to the customer's computer, without physically delivering the software on storage media. It wouldn't take much to shove an entire camel through the eye of that needle.

Computer-Generated Output

The sale of computer-generated output is subject to sales tax if the output is the true object of the contract, such as artwork, graphics, and designs. Similarly, your fees for data entry and verification are taxable.

Data processors, however, often rely on the rule that charges for processing customer-furnished information are not taxable. Moreover, regulations state that computer graphics produced in connection with the performance of architectural, engineering, accounting, or similar professional services are not subject to sales tax, because they are considered to be furnished incidentally to the performance of a service.

In some cases, the original output is not taxed, but the client requests a number of copies. If that's the case, charges for making those additional copies are taxed, even if it's not separately stated on the invoice.

To illustrate, consider a fictitious hardware engineer using CAD software to design the layout of components on a circuit board from schematic diagrams provided by a client. Upon completion, the engineer delivers a photoplot that the client uses to manufacture boards in-house. Sometimes the engineer modems designs to the client, and the clients prepare their own photoplot.

There won't be a sales tax on the engineering design charges, regardless of whether those charges are separately itemized, a finished photoplot is delivered, or just a design is modemed. However, tax does apply to that portion of the charges relating to physical production of the photoplot itself. In order to avoid sales tax entirely, the engineer should modem the design rather than deliver camera-ready art such as a photoplot.

The Latest Word

In February 1993, the Superior Court in San Francisco refused to allow the Board of Equalization to impose a sales tax on copyrighted databases that were transferred on magnetic tape, to then be accessed by third parties. The Board had argued that the entire transaction was a taxable lease of magnetic tapes. The Court found, however, that the transfer of the right to sell access to the databases is an intangible right distinct from the tape itself.

This decision is highly favorable to the taxpayer, and differs from similar cases decided in other states. The Board of Equalization has plainly lost the round, and has appealed it. The appeal should be anxiously monitored by just about every Californian who transfers copyrighted databases, patents, trade secrets, know-how, and similar intangibles on magnetic or optical media. For readers wishing to follow the case more closely, the cite is *Unisys Corp. v. State Bd. of Equalization*, California Superior Court, San Francisco County, appeal docketed, No. A062663 (1993).

To reduce uncertainty in determining if a particular software transaction is subject to sales tax, look before leaping into a deal—especially in less familiar states. Aim to structure the transaction to conform to established guidelines and practices shown to pass muster in courts in that state. ■

Complimentary reprints of the following are available from David Simon's office in Oakland at (510)893-5753.

Regulation No. 1502, Sales and Use Tax Regulations: Computers, Programs, and Data Processing (1988)

Walter Hellerstein, "State and Local Taxation of Intangibles Generates Increasing Controversy," *Journal of Taxation* (May 1994), reprinted with permission of the publisher, Warren Gorham Lamont.

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$349.97

UPGRADE TO SOUND BLASTER AWE 32 - ADD $200

EMPEROR 4X-SCSI

4X QUAD SPEED

TOSHIBA 3501B QUAD SPEED SCSI CD
155MS ACCESS TIME · 600KB/S TRANSFER
SOUND BLASTER 16 SCSI-2 SOUND
PAIR OF STEREO SPEAKERS
24 TITLE SUPER BUNDLE (SEE SIDE BAR)

Sound Blaster — MPC Multimedia PC

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ENVISION SUPER 16 TITLE BUNDLE

INCLUDED WITH ALL ENVISION MULTIMEDIA SYSTEMS & KITS

Compton's Encyclopedia

PLUS:

- *Just the Fax*
- *Grammar Examiner*
- *Body Transparent*
- *Millionaire II*
- *The Fiction Advisor*
- *Jigsaw! The Ultimate Electronic Puzzle*
- *Algebra I First Semester*
- *Algebra II Secons Semester*
- *The Bernstein Bears Learn About Counting*
- *The Bernstain Bears Junior Jigsaw*
- *Math Maze*
- *States & Traits*
- *Revolution 76*
- *Designasaurus*

5 Foot 10 Pak Vol.2 (10 CDs)	29	Dark Seed	25	Kid's Read: Scary Poems	9	PC Library	19
7th Guest (2 CDs)	19	Day of the Tentacle	19	King's Quest VI	19	Peter & the Wolf	9
America Alive!	19	Destination: Mars	19	Kodak Photo CD Access	15	Pro Phone Business -1993	19
Animals, San Diego Zoo	10	Dinosaur Adventure	19	Legend of Kyrandia	25	Protostar	25
Arthur's Teacher Troubles	15	Dinosaur Encyclopedia	19	MacMillian Children's Dictionar	19	Quick & Easy Spanish	19
Arts & Letters Draw: Warbirds	15	Dinosaur Safari	19	Mad Dog McCree	19	Rebel Assault	25
Asia Alive!	19	Dr. T's Sing-Along for Kids	19	Man Enough	25	Relate with Ease	25
Audubon's Birds	15	European Racers	19	Mario is Missing	19	Return to Zork	19
Audubon's Mammals	15	F-117A Stealth Fighter	15	Mathematics Library	19	Ring World	25
Auto Almanac	19	F15 Strike Eagle III	15	Mavis Beacon Teaches Typing	19	Rock, Rap & Roll	15
Back Road Racers	19	Family Doctor	19	Mayo Clinic Health Book	19	Secret Weapons of the Luftwaf	19
Battle Chess Enhanced	15	Family Bible	19	MegaRace	19	Space Adventure	19
Barney Bear Goes to School	19	Gardening	19	Microcosm	19	Space Quest IV	19
Barney Bear Goes to Space	19	Great Literature Plus	19	Microsoft Bookshelf '94	39	Sports Illustrated Almanac '94	19
Beauty & the Beast	9	Grolier's Encyclopedia 1.5	9	Microsoft Cinemania '94	39	Star Trek-25th Aniversary	25
Berlitz French (8 CDs)	99	Grolier's Encyclopedia 6.0	19	Microsoft Dinosaurs	39	Star Wars Chess	19
Berlitz German (8 CDs)	99	Gunship 2000	19	Microsoft Golf	25	Stellar 7	19
Berlitz Spanish (8 CDs)	99	Home Medical Advisor	15	Microsoft Works 3.0 MM	39	Street Atlas USA	95
Best of Media Clips	9	Hugo's House of Horrors	9	Monarch Notes	19	Tempra Access	15
Bibles & Religion	9	Indiana Jones/Fate of Atlantis	19	MPC Wizard 2.0	19	TFX Tactical Fighter	25
Blue Force	19	Iron Helix	25	Multimedia World History	19	The Lawnmower Man	25
Business 500	19	Journeyman Project	25	Nat'l Geographic: Birds	9	Time Table of History	29
Business Library (12 Titles)	19	Jurassic Park Screen Saver	15	Nat'l Geographic: Butterflies	9	Time: Man of the Year	9
Capitol Hill	15	Just Grandma & Me	15	Nat'l Geographic: Dinosaurs	9	Tower of Terror	19
Clinton	15	Kid's Read: Aesop's Fables	15	Nat'l Geographic: Farm Anima	9	U.S. Air Force: Clips	9
College Handbook	19	Kid's Read: Benjamin Bunny	9	Nat'l Geographic: Mammals	9	U.S. Amphibious Assault: Clips	9
Colossal Cook Book	9	Kid's Read: Cinderella	15	Nat'l Geographic: Spiders	9	U.S. Atlas MPC	19
Compton's Int. Encyclopedia	19	Kid's Read: Heather Hits	15	Nat'l Geographic: Whales	9	U.S. Marines: Clips	9
Conspiracy	25	Kid's Read: Mud Puddle	15	National Parks	19	U.S. Military Helicopter: Clips	9
Corel Art Show 4	15	Kid's Read: Paper Bag Princes	15	Newsweek Interactive	15	U.S. Navy Aircraft: Clips	9
CyberRace	25	Kid's Read: Peter Rabbit	15	Parenting	19	U.S. Navy Ships: Clips	9

NEW ARRIVALS
NEW TITLES EVERY WEEK!

Aegis: Guardian of the Fleet	25
Ambush at Sorinor	19
Central Intelligence	25
Civilization	19
Dameon's Gate	25
Dino/Space Adventure (2-in-1)	29
Dracula Unleashed	25
Frankenstein	15
Geekwad	19
Grooves	19
Haldeman Diaries: Nixon Yrs	19
Harpoon CD-ROM	19
Hobbe's OS/2	25
Inca II	19
Legends of Oz	19
Mad Dog McCree 2	25
Microsoft Complete Baseball	39
Microsoft Encarta '95	49
Monarch Notes	19
Movie Select	29
Outpost	9
Ozzie's World	19
Shuttle	9
SimCity 2000	9
Star Crusader	19
Syndicate	9
Twain's World	29
UFO: Enemy Unknown	9
Ultimate Domain	25

ADULT CD TITLES
MUST BE 18 OR OLDER!

101 Sex Positions	35
Adult Movie Almanac	39
Adventures of Seymour Butts	39
Amorous Asian Girls	25
Asian Palette	29
Baby's Got Butt	29
Centerfold & Covergirls	25
College Girls	29
Dirty Debauntes (HOT!)	35
Dream Machine (HOT!)	39
Erotic Adult Sampler	9
House of Dreams	29
Immortal Desire	29
Ladies' Club Poker Night	29
Legend 4	29
Menage A Trois	29
Naughty Butt Nice	29
New Wave Hookers	29
Night Watch Interactive II	39
Sensual Pleasure	19
Sexy Lingerie	19
Seymour Butts in Paradise	29
Sorority House	45
Sweet Body	19
The Legend of Kama Sutra	29
Traci Lords: I Love You	29
Urotsujidoji (HOT!)	29
Virgins	29
Virtual Vixens (HOT!)	39

ENVISION® MULTIMEDIA COMPUTER CENTERS LA's #1

AFFORDABLE PENTIUM POWER

Pentium POWERSTATIONS

Stuck in the computer slow lane? Then try Envision's Pentium Powerstations on for size! Envision has value priced Pentiums to fit your budget starting from under $1,400. With performance up to 250% faster than a 486DX2-66, they fly. At these prices, they'll leave our showrooms even faster! Come in to an Envision Multimedia Computer Center and try one on for size today.

Intel Pentium 250% Faster Than 486

Envision Pentium Powerstations are powered by advanced Intel Pentium™ technology for performance up to 250% faster than 486DX2-66s.

3.3 Volt Design

Envision Pentium 90 & 100 MHz Systems incorporate new 3.3 Volt technology for lower power consumption and cooler operation so that your computer can run more optimally and efficiently.

Enhanced IDE Hard Disks

Enhanced IDE is standard on all Pentium Powerstations giving you super fast access to your data at lightning-fast 11 MB/s tranfer rates for up to 3 times the performance of typical IDE drives.

64-bit Accelerators

64-bit PCI graphics accelerators are now standard on all Pentium Powerstationsgiving you two to three times faster graphics than average 32-bit graphics accelerators. That way, you can see what you want to see with less waiting.

Hi-Speed Serial Ports & Enhanced Parallel Ports

Every Envision Pentium Powerstation also comes with two hi-speed 16550 UART serial ports, for faster data transfer with your hi-speed modem or serial device, and an enhanced parallel port for bi-directional buffered communications between your printer and your computer for error-free printing.

FINANCE $50*

Standard System Features

Intel Pentium-60 or 90 MHz CPUs
3 PCI Local Bus Slots & 4 16-bit ISA Slots
Energy Star Green PC Power Saver
256K External Write-back Cache (ex to 512K)
3.5" 1.44MB Floppy Drive
32-bit Enhanced IDE HD Controller
Up to 11MB/s Transfer Rates (2-3x faster)
2 Hi-Speed 16550 Serial Ports
ECP/EPP Enhanced Parallel Port
Medium Tower Case/230W UL PS
Enhanced 101-key Keyboard & Serial Mouse

Multimedia System Features

Double or Quad Speed CD-ROMs
16-bit Sound Card or Sound Blaster 16
Pair of Speakers (Magnetically Shielded)
16 CD Titles included ($700 Value)

See *MULTIMEDIA KITS* on first page for full description

Pentius 60	$1,349
Pentius 90	$1,599
Pentius 100	$1,999

Standard System Features plus:
- 4MB RAM on-board, exp to 128MB
- 425MB Enhanced IDE HD (540MB-Add $50)
- 12ms Access Time & 11MB/s Transfer Rate
- Super Fast 64-bit PCI SVGA Accelerator/1M
- 14" Super VGA Non-Interlaced Monitor (0.28)
- Low Radiation & Energy Star Power Saver

MULTIMEDIA SYSTEMS		PENTIUM 60MHz	PENTIUM 90MHz	PENTIUM 100MHz
2X	STARTER 2X DOUBLE SPEED CD ROM 16-BIT JAZZ SOUND CARD	1549	1799	2199
2X	EXPLORER 2X DOUBLE SPEED CD-ROM SOUND BLASTER 16 MCD	1579	1829	2229
4X	ADVENTURER 4X TEAC 4X CD-ROM (195MS) SOUND BLASTER 16 MCD	1699	1949	2349
4X	EMPEROR 4X TOSHIBA 4X CD-ROM (155MS) SOUND BLASTER 16 SCSI-2	1799	2049	2449

Maximus 60	$1,599
Maximus 90	$1,849
Maximus 100	$2,249

Standard System Features plus:
- 8MB RAM on-board, exp to 128MB
- 540MB Enhanced IDE HD (730MB-Add $100)
- 11ms Access Time & 11MB/s Transfer Rate
- Super Fast 64-bit PCI SVGA Accelerator/1M
- 15" Flat SVGA Non-Interlaced Monitor (0.28) Flat Screen & Low Radiation

MULTIMEDIA SYSTEMS		PENTIUM 60MHz	PENTIUM 90MHz	PENTIUM 100MHz
2X	STARTER 2X DOUBLE SPEED CD-ROM 16-BIT JAZZ SOUND CARD	1799	2049	2449
2X	EXPLORER 2X DOUBLE SPEED CD-ROM SOUND BLASTER 16 MCD	1829	2079	2479
4X	ADVENTURER 4X TEAC 4X CD-ROM (195MS) SOUND BLASTER 16 MCD	1949	2199	2599
4X	EMPEROR 4X TOSHIBA 4X CD-ROM (155MS) SOUND BLASTER 16 SCSI-2	2049	2299	2699

Colossus 60	$2,549
Colossus 90	$2,799
Colossus 100	$3,199

Standard System Features plus:
- 16MB RAM on-board, exp to 128MB
- 1.08GB Enhanced IDE Hard Disk
- 10ms Access Time & 11MB/s Transfer Rate
- 64-bit PCI ATI mach64 Accelerator/2M
- World's Fastest Graphics (42M Winmarks)
- Mag 17" Flat SVGA NI Monitor (0.26)
- Award Winning 17" Flat Screen Monitor

MULTIMEDIA SYSTEMS		PENTIUM 60MHz	PENTIUM 90MHz	PENTIUM 100MHz
2X	STARTER 2X DOUBLE SPEED CD-ROM 16-BIT JAZZ SOUND CARD	2749	2999	3399
2X	EXPLORER 2X DOUBLE SPEED CD-ROM SOUND BLASTER 16 MCD	2779	3029	3429
4X	ADVENTURER 4X TEAC 4X CD-ROM (195MS) SOUND BLASTER 16 MCD	2899	3149	3549
4X	EMPEROR 4X TOSHIBA 4X CD-ROM (155MS) SOUND BLASTER 16 SCSI-2	2999	3249	3649

It answers the phone! It faxes! It plays music & data CDs! It's even a TV*?!?

Introducing Family•STATION

FamilySTATION... it's a whole new type of computer. That's because it's not just a computer, it's also a fax machine, modem, answering machine, CD stereo system, cable-ready TV, video game player & multimedia computer all in one complete unit. It also includes loads of useful software for the whole family. With Microsoft Works which includes a spreadsheet, word processor & database, Dad can bring home work from the office. Mom can manage the family finances with Microsoft Money. Son can research the world with the 21 Volume Compton's Encyclopedia. Daughter can find the latest news for her report with America Online. Imagine doing so much from one place! It's FamilySTATION... built with your family in mind.

Intel Inside

Envision FamilySTATIONs are powered by genuine Intel 486 & Pentium technology for maximum performance, reliability and 100% guaranteed compatibility.

It's a CD Stereo System

You can select you favorite music CD to keep you relaxed while you type away. And with a built-in mixer, you can adjust the volume or balance.

It's a Video Game Player

Play your favorite video game like Rebel Assault or SimCity 2000. You'll get blown away by the realistic sounding sound effects from the built-in 16-bit sound card. And you can plug in your favorite joystick.

It's an Answering Machine

The FamilySTATION can answer your phone with the built-in voice mail system. It can direct messages to up to 999 mailboxes or page you when you get a message.

It's a Fax Machine & Modem

Receive or send faxes anywhere in the world with the built-in fax. Or call your favorite online service to see the latest news, shop at thousands of stores, or check your bank account balance with the built-in modem. You can even hook into Internet, that "information superhighway" you've been hearing so much about.

It's a Cable-Ready TV*

You can add optional TV capability to your FamilySTATION so that you can watch the latest news or your favorite programs without leaving your PC.

It's a Multimedia Computer

At the heart of every FamilySTATION is a full multimedia compter system ready to access the more than 5000 multimedia CD-ROM titles now on the market from 21 volume full encyclopedias to interactive stories that read to kids to educational programs that can teach you kids subjects like history or calculus or access great works of literature to exciting games that let you conquer the world or build your own special world.

It's Loaded with Software

It comes with lots of software like Microsoft DOS, Microsoft Windows, Microsoft Works, Microsoft Money, Compton's Encyclopedia, America Online, and 30 more exciting titles including exciting action-packed games.

**Optional TV capability is $179 extra.*

SPECIFICATIONS

- Intel 486 or Pentium CPUs
- 4MB Memory, ex to 64MB (8MB-Add $150)
- 3.5" 1.44MB Floppy Drive
- 425MB Hard Drive, upgradable to 1,080MB
- 14" Super VGA Non-Interlaced Monitor (0.28)
- Enhanced 101-key Keyboard & Mouse
- Double Speed CD-ROM Drive
- 16-bit Stereo Sound Card & Speakers
- 14,400bps Fax & Modem
- Voice Mail Phone Messaging System
- Optional TV Tuner available

LOADS OF SOFTWARE INCLUDED

- Microsoft DOS 6.22
- Microsoft Windows 3.11
- Microsoft Works 3.0
- Microsoft Money 3.0 (family finance manager)
- 21 Volume Compton's Encyclopedia
- America Online & 30 more exciting titles!

4 Models to Choose From

486SLC2-66	$1,299
486DX2-66	$1,399
Pentium 60	$1,799
Pentium 90	$1,999

OR FINANCE FROM $51/MO

COMPUTER SOURCE

PAY NO INTEREST 'TIL APR 1995

IBM 486SLC2-66
$798.88

- IBM 486SLC2-66 CPU/Cpu Fan
- 128K External Cache
- 4 MB RAM
- 3.5" 1.44M Floppy Drive
- 260 MB IDE Hard Disk (Add $40 for 425MB)
- 32-bit VLB IDE-I/O HD/FD Controller
- 32-bit Super VGA Graphics Accelerator/1M
- 14" 1024x768 Super VGA Monitor (Add $30 for 14" SVGA Non-Interlaced)
- 2 Serial/Parallel/Game Ports
- Mini Tower Case, 101-key Keyboard & Mouse

FINANCE as low as $29* per month

WITH MULTIMEDIA

STARTER 2X	EXPLORER 2X
$999	$1029
2X CD-ROM · 16-BIT SB-COMPATIBLE SOUND CARD · SPEAKERS · 16 TITLES	2X CD-ROM · SOUND BLASTER 16 SOUND CARD · SPEAKERS · 16 TITLES
ADVENTURER 4X	**EMPEROR 4X-SCSI**
$1149	$1249
TEAC 4X CD · SOUND BLASTER 16 SOUND CARD · SPEAKERS · 16 TITLES	TOSHIBA 4X SCSI CD-ROM · SOUND BLASTER 16 SCSI · SPKRS · 16 TITLES

SEE MULTIMEDIA KITS ON FIRST PAGE FOR FULL DESCRIPTION

INTEL 486DX2-66
$948.88

- Intel i486DX2-66 CPU/CPU Fan
- Pentium Overdrive Upgradable (P24T)
- 256K External Write-Back Cache
- 4 MB 72 Pin RAM, exp to 64 MB
- 3.5" 1.44M Floppy Drive
- 425 MB IDE Hard Disk (Add $50 for 540MB)
- 32-bit VLB IDE-I/O HD/FD Controller
- 32-bit Super VGA Graphics Accelerator/1M
- 14" 1024x768 SVGA NI Monitor (0.28dp) NON-INTERLACED/GREEN PC/LOW RADIATION
- 2 Serial/Parallel/Game Ports
- Mini Tower Case, 101-key Keyboard & Mouse

FINANCE as low as $35* per month

WITH MULTIMEDIA

STARTER 2X	EXPLORER 2X
$1149	$1179
2X CD-ROM · 16-BIT SB-COMPATIBLE SOUND CARD · SPEAKERS · 16 TITLES	2X CD-ROM · SOUND BLASTER 16 SOUND CARD · SPEAKERS · 16 TITLES
ADVENTURER 4X	**EMPEROR 4X-SCSI**
$1299	$1399
TEAC 4X CD · SOUND BLASTER 16 SOUND CARD · SPEAKERS · 16 TITLES	TOSHIBA 4X SCSI CD-ROM · SOUND BLASTER 16 SCSI · SPKRS · 16 TITLES

SEE MULTIMEDIA KITS ON FIRST PAGE FOR FULL DESCRIPTION

INTEL PENTIUM-60
$1268.88

- Intel Pentium-60 CPU/CPU Fan
- 256K External Write-Back Cache
- 4 MB RAM, exp to 128 MB
- 3.5" 1.44M Floppy Drive
- 540 MB IDE Hard Disk (Add $90 for 730MB)
- 32-bit VLB IDE-I/O HD/FD Controller
- 32-bit Super VGA Graphics Accelerator/1M
- 14" 1024x768 SVGA NI Monitor (0.28dp) NON-INTERLACED/GREEN PC/LOW RADIATION
- 2 Serial/Parallel/Game Ports
- Mini Tower Case, 101-key Keyboard & Mouse

FINANCE as low as $46* per month

WITH MULTIMEDIA

STARTER 2X	EXPLORER 2X
$1469	$1499
2X CD-ROM · 16-BIT SB-COMPATIBLE SOUND CARD · SPEAKERS · 16 TITLES	2X CD-ROM · SOUND BLASTER 16 SOUND CARD · SPEAKERS · 16 TITLES
ADVENTURER 4X	**EMPEROR 4X-SCSI**
$1619	$1719
TEAC 4X CD · SOUND BLASTER 16 SOUND CARD · SPEAKERS · 16 TITLES	TOSHIBA 4X SCSI CD-ROM · SOUND BLASTER 16 SCSI · SPKRS · 16 TITLES

SEE MULTIMEDIA KITS ON FIRST PAGE FOR FULL DESCRIPTION

PERFORMANCE, SERVICE & OPTIONS!

MORE PERFORMANCE

*Envision doesn't only have the lowest price on computers in town, it also has the **highest performance computers** in town utilizing the latest and best in **new computer technologies.***

4X - QUAD SPEED CD-ROM

Quad-speed CD-ROM drives are now available in the entire lineup of Envision systems giving you a whole new dimension in multimedia performance. With 600KB/s Transfer Rates, they run twice as fast as regular double speed CD-ROM drives and 50% faster than triple speed CD-ROM drives for xtra performance.

MODE 3 ENHANCED IDE HD

*Many Envision systems now incorporate the newest in hard drive technology like **Mode 3 Enhanced IDE**. With **transfer rates** from **11 to 16 MB/s**, Mode 3 Enhanced IDE represents a new breed of hard drives designed for optimal performance. Running up to **3 times faster** than typical IDE drives and faster than even SCSI-2 drives, Enhanced IDE really gives you more bang for your buck.*

FAST 64-BIT GRAPHICS

*Many Envision Systems now feature **super fast 64-bit Graphics Accelerators**, which process video data **64 bits** at a time, for video performance that is more than **twice as fast** as normal 32-bit accelerators making them perfect for handling and processing complex graphics like CAD, desktop publishing graphics design and animation, and vector/raster graphics.*

MORE SERVICE

Envision also has some of the best service and support. At Envision, we feel that it the most important factor in choosing a computer is not the price or performance, but the place you buy it from. That's why our staff is dedicated to giving you the best service and support possible.

2 YEAR LABOR/1 YEAR PARTS WARRANTY

*All Envision Systems are backed with Envision's exclusive **2 years labor** and **1 year parts warranty** for piece of mind.*

GE Service Protection Plus Extended 4 Year Service Plans

*And for added piece of mind, you can add a **4 year on-site extended service plan** from **General Electric** - the nation's leader in high technology service and suport.*

96 HOUR BURN-IN TESTING

*All Envision Systems are run through Envision's comprehensive **96-hour burn-in** testing to ensure system integrity & reliability.*

ASSEMBLED IN THE USA

*Envision Systems are assembled right here in the **United States** at our Southern California computer factory using only the finest components made by such big manufacturers as **Intel, IBM, Conner, Teac, Sony, ATI, Diamond** and **Creative Labs.***

CUSTOM CONFIGURATIONS

Envision has many different models to choose from but if you don't see the configuration that best suits your need, we would be happy to custom configure your system the way you want. Just ask your friendly Envision sales representative for more details on the many options that you can add.

FINANCING

Envision offers you many differents ways to buy an Envision computer. You can pay by cash, check, VISA, or MasterCard. Envision also has many different financing plans to fit your budget.

NO INTEREST 'TIL 1995

*You can select our 90 days same as cash plan which gives you up to **90 days** to pay for your computer **without paying any interest!** That means you'll pay no interest 'til 1995!*

MONTHLY PAYMENT PLANS

*You can also select our closed-end **financing plans** with terms of **up to 60 months** with reasonable monthly payments that won't break the bank.*

A FRIENDLY & KNOWLEDGABLE STAFF

8+ YEARS IN THE INDUSTRY

486 VALUESTATIONS

i486DX2 VALUESTATIONS

FINANCE as low as $43* per month

Ultima VLB $1,199

Standard System Features

- Intel 486DX2-66 MHz CPU/CPU Cooling Fan
- 8MB RAM on-board, exp to 64MB
- Energy Star Green PC Power Saver
- 256K L2 External Write-back Cache
- 3.5" 1.44MB Floppy Drive
- 540MB Enhanced IDE HD (730MB-$100)
- 11ms Access Time & 11MB/s Transfer Rate
- 32-bit Enhanced IDE HD Controller
- Up to 11MB/s Transfer Rates (2-3x faster)
- 15" Flat SVGA Non-Interlaced Monitor (0.28)
- Fast 32-bit SVGA Graphics Accelerator/1M
- Medium Tower Case/230W UL PS
- Enhanced 101-key Keyboard & Serial Mouse

Multimedia System Features

- Double or Quad Speed CD-ROMs
- 16-bit Sound Card or Sound Blaster 16
- Pair of Speakers (Magnetically Shielded)
- 16 CD Titles included *(Over $700 Value!)*

See ***MULTIMEDIA KITS*** on first page for full description

	MULTIMEDIA SYSTEMS	486DX2 66MHz
2X	STARTER 2X	1399
2X	EXPLORER 2X	1429
4X	ADVENTURER 4X TEAC 4X CD-ROM (195MS) SOUND BLASTER 16 MCD	1549
4X	EMPEROR 4X TOSHIBA 4X CD-ROM (155MS)	1799

Performa PCI/VLB $1,299

	MULTIMEDIA SYSTEMS	486DX2 66MHz
2X	STARTER 2X DOUBLE-SPEED CD-ROM	1499
2X	EXPLORER 2X	1529
4X	ADVENTURER 4X TEAC 4X CD-ROM (195MS) SOUND BLASTER 16 MCD	1649
4X	EMPEROR 4X TOSHIBA 4X CD-ROM (155MS) SOUND BLASTER 16 SCSI-2	1749

ENVISION
MULTIMEDIA COMPUTER CENTERS

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2 NEW LOCATIONS IN SOUTHERN CALIFORNIA COMING SOON TO AN AREA NEAR YOU!

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Resources

Calendar Of Events

Conferences, Shows, Special Events

January

January 4–7 Macworld Expo. San Francisco. IDG World Expo. Call: Mitch Hall & Assoc., (617)361-2001.

January 7 California Computer Mart. Glendale Civic Auditorium. Computer Super Shows. Call: (714)459-6105.

January 7 Computer Show And Sale. Scottish Rite Center, San Diego. MarketPro Shows. Call: 1-800-708-7555.

January 7–8 Computer Marketplace Show. Pomona Fairplex. National Productions. Call: 1-800-800-5600.

January 8 Computer Show And Sale. Antelope Valley Fairgrounds, Lancaster. MarketPro Shows. Call: 1-800-708-7555.

January 9–11 RSA Data Security Conference. Redwood Shores. RSA Data Security, Inc. Call: (415)595-8782.

January 11–12 PDA Industry Forum. San Jose. Apple, Sharp, Casio, Motorola, IBM. Call: Nola Armijo, (415)821-0191.

January 13–15 TechGraphics '95 Expo. Portland, OR. Pacific Printing & Imaging Assoc. Call: 1-800-280-6218.

January 14 Computer Show And Sale. Fresno Fairgrounds. MarketPro Shows. Call: 1-800-708-7555.

January 14–15 Computer Marketplace Show. Sherman Entertainment Center, Reseda. National Productions. Call: 1-800-800-5600.

January 14–15 Computer Show And Sale. Ventura Fairgrounds. MarketPro Shows. Call: 1-800-708-7555.

January 14–15 Computer Show And Sale Expo. Panorama City. Bonanza Show Productions. Call: Paul, (415)595-1053.

January 19–22 Medicine Meets Virtual Reality III: Interactive Technology And The New Paradigm For Healthcare Conference. San Diego. UCSD School of Medicine. Call: (619)751-8841.

January 21–22 Computer Marketplace Show. Pomona Fairplex. National Productions. Call: 1-800-800-5600.

January 21–22 Computer Show And Sale. Del Mar Fairgrounds. MarketPro Shows. Call: 1-800-708-7555.

January 22 California Computer Mart. Long Beach Convention Center. Computer Super Shows. Call: (714)459-6105.

January 28 Computer Marketplace Show. Earl Warren Showgrounds, Santa Barbara. National Productions. Call: 1-800-800-5600.

January 28 Computer Show And Sale Expo. Valley Indoor Swap Meet Building, Pomona. Bonanza Show Productions. Call: Paul, (415)595-1053.

January 28–29 Computer Show And Sale. Oxnard Community Center. MarketPro Shows. Call: 1-800-708-7555.

January 29 ACP Computer Swap Meet. 1310 E. Edinger, Santa Ana. ACP. Call: (714)558-8813.

February

February 4 Computer Marketplace Show. Sherman Entertainment Center, Reseda. National Productions. Call: 1-800-800-5600.

February 5 Computer Marketplace Show. Sequoia Conference Center, Buena Park. National Productions. Call: 1-800-800-5600.

February 5 Computer Show And Sale. Antelope Valley Fairgrounds, Lancaster.

CALL FOR CONTRIBUTORS

VOLUME ON COMMUNITIES IN CYBERSPACE

A volume entitled Communities in Cyberspace is being prepared for publication by the University of California Press. The editors are looking for papers that examine the subject of online interaction and community. Papers should focus on existing examples of online interaction, with particular attention to the collective organization of groups, the emergence of community, and the issues, conflicts, and problems that go along with those developments. To be considered for inclusion, prospective authors should submit a 300- to 500-word abstract and a brief biographical statement. Submissions should be sent via mail, email, or fax no later than February 1 to Peter Kollock and Marc Smith, UCLA Dept. of Sociology, 405 Hilgard Ave., Los Angeles, CA 90024-1551; email: kollock@soc.sscnet.ucla.edu or smithm@nicco.sscnet.ucla.edu; or fax: (310)206-9838.

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The 1995 Los Angeles Consumer Technology World features over five hundred exhibitors of computer hardware, software, and accessories; and educational seminars and demonstrations of the latest technology by Apple, IBM, Microsoft, Claris, Brøderbund, and Intel. Admission to the exhibits only is $7, exhibits and seminars is $15. Call 1-800-800-5600 for more information.

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January 14 & 15 Saturday & Sunday	**RESEDA** - Sherman Entertainment Center From 101 Freeway, take Reseda off ramp, turn left (if traveling East) to Sherman Way, turn right, one block to Canby Street. 18430 Sherman Way.	Admission: $5.00
January 21 & 22 Saturday & Sunday	**POMONA** - Fairplex (LA County Fairgrounds)	Admission: $7.00
January 28 Saturday	**SANTA BARBARA** - Earl Warren Showgrounds	Admission: $5.00
February 4 Saturday	**RESEDA** - Sherman Entertainment Center	Admission: $5.00
February 5 Sunday	**BUENA PARK** - Sequoia Conference Center Take the Beach Blvd. Exit off the 91 Freeway, go one block North to 7530 Orangethorpe.	Admission: $5.00

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Resources

MarketPro Shows. Call: 1-800-708-7555.

February 11 Computer Show And Sale. Fresno Fairgrounds. MarketPro Shows. Call: 1-800-708-7555.

February 11–12 Consumer Technology World. Pomona. National Productions. Call: 1-800-800-5600.

February 12 Computer Show And Sale. Scottish Rite Center, San Diego. MarketPro Shows. Call: 1-800-708-7555.

February 15–17 Southwest Regional Government Technology Conference. Austin, TX. GTC. Call: Paul Fairbrother, (512)794-9938.

February 18 Computer Show And Sale. Kern County Fairgrounds, Bakersfield. MarketPro Shows. Call: 1-800-708-7555.

February 18–19 Computer Show And Sale. Ventura Fairgrounds. MarketPro Shows. Call: 1-800-708-7555.

March

March 5 Computer Show And Sale. Scottish Rite Center, San Diego. MarketPro Shows. Call: 1-800-708-7555.

March 7–9 Documation '95 Conference And Expo. Long Beach. Graphic Communications Association. Call: Marion Elledge for conf. info, (703)519-8160.

March 11–12 Computer Show And Sale. Ventura Fairgrounds. MarketPro Shows. Call: 1-800-708-7555.

March 12 Computer Show And Sale. Antelope Valley Fairgrounds, Lancaster. MarketPro Shows. Call: 1-800-708-7555.

March 12 Computer Show And Sale. Fresno Fairgrounds. MarketPro Shows. Call: 1-800-708-7555.

March 14–16 New Media Expo. Los Angeles. The Interface Group. Call: (617)449-6600.

March 26 ACP Computer Swap Meet. 1310 E. Edinger, Santa Ana. ACP. Call: (714)558-8813.

Classes, Seminars, Workshops

January

January 5–6 Certified NetWare Engineer Quickpath Test Review Course. Irvine. Center for Advanced Professional Development. Call: (714)261-0240.

January 9 Basic Mac Skills I Class. Los Angeles. American Film Institute. Call: 1-800-999-4AFI or (213)856-7690.

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January 30–February 1 Interface Design Class. Los Angeles. American Film Institute. Call: 1-800-999-4AFI or (213)856-7690.

February

February 1–22 Hypercard Authoring Tools Class. Los Angeles. American Film Institute. Call: 1-800-999-4AFI or (213)856-7690.

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February 13–14 Understanding Document Imaging Seminar. Costa Mesa. Data-Tech Institute. Call: (201)478-5400.

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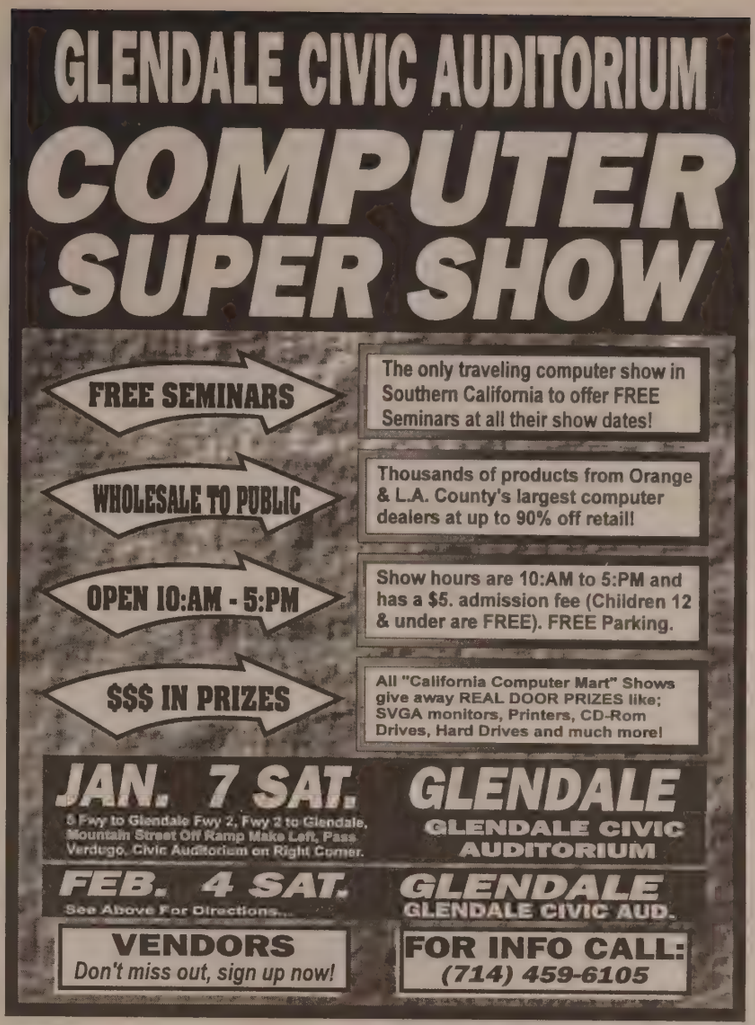
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March

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User Group Network

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Asia America BBS. (310)326-1683; (714)772-5301; (818)284-4519, 989-2041. 8-N-1, 2400/9600/ 14,400. Focus on Pacific Rim economy, cultural and business exchanges. Free. Sysop: Bob F. Howard. [Exp. #132.]

Atlantis, The Lost BBS. (714)256-1360, 828-6459; (818)859-6300, 579-4143, 798-4007. 2400–16,800. RIP, multiline chat, games, forums, and fun. Sysop: Ron DeRuyter. [Exp. #133.]

Aussie BBS. (310)425-5710, 835-4800; (714)670-6500, 537-4300, 572-8800; (818)961-1700. 18 14,400 lines. 35,000+ files, TradeWars 2002, 30 multiuser games, Internet, RIP support. Free trial. Sysop: Mike Szabados. [Exp. #132.]

The Castle. (213)293-0070, 936-9951; (818)637-8339, 794-0302, 985-6075. 14,400. 50 lines. MUDs, games, chat, 20GB library, Internet, and more! Free trial. Sysop: Steve de Mena. [Exp. #134.]

Close Encounters. (310)947-3997, 902-9538. 24 hrs., 300/1200/2400. Local to many 213, 310, 714, 818, and 909 areas. Multiline social interaction system. [Exp. #132.]

Compu-Net BBS. (310)822-0038, 544-4095; (818)782-3623. Internet access. CompuScans, CD-ROMs, dating, adult, windows, IBM, Mac. [Exp. #134.]

Crystal Palace. (310)472-2598, (818)765-2171. 8-N-1, 24 hrs., 300–14,400. 15+GB of GIFs, stories, shareware; Netmail; msg. database; matchmaker; games; computer store. Sysop: Daniel Mathis. [Exp. #133.]

CyberChat BBS. (310)441-1465, (818)784-0007. 2400–14,400. Chat, younger crowd, CD-ROM, gay/bi sections, trivia, games, adult files. Sysop: Spyke. [Exp. #133.]

Digital Excursion. (213)874-9895; (818)951-9377, 951-9477. 24 hrs., 28,000. Offers graphical interface for Mac/Windows; CD-ROMs, OneNet. Free trial. Sysop: Nathaniel Lord. [Exp. #134.]

EDEN—The Electronic Garden. (310)421-2420; (714)548-1900, 530-6335. 24 hrs., 14,400. 32 lines. Adults only "playground," featuring chat, games, email, forums, files, and fun. Sysop: Daniel Vesely. [Exp. #134.]

KBBS Los Angeles. (213)725-3047; (310)558-0145; (805)520-7323; (818)886-0872. 300–28,800. 68 lines. 30GB shareware, adult; chat, full Internet, Usenet, coffee meets. Free trial. [Exp. #134.]

Korea America Online. (213)962-3634, (714)449-9373. 1200–14,400. 16 lines. Bilingual, Korean programs, information, chat, BBS in Korea list. $10/month, $80/year unlimited access. Sysop: Wayne Jeong. [Exp. #132.]

LA Online. (213)936-1160; (310)372-4050, 445-0633; (818)577-2131. 8-N-1, 1200–14,400. News, movie times, events, shopping, publications. Always free. [Exp. #134.]

Miller's Party Board. (213)727-0251, 569-9191; (310)815-0117, 212-3469, 929-4304; (714)739-1060, 537-4436; (805)583-3142; (818)879-1333, 700-0627, 240-8296, 769-2302, 577-5880, 961-2458. 14,400. 32 lines. Chat, live games, 4GB library, pub areas, WorldLink, and more. 14-day free trial. Sysop: Jack Stern. [Exp. #134.]

Modemboy BBS. (310)659-7000, 417-5157; (818)846-3000, 996-7900. Gay/bi/curious? Free chat, instant access, 18+, local events, campy fun. [Exp. #134.]

Modem Butterfly's BBS. (310)841-6900, 767-1010, 421-9231; (714)828-5500; (805)581-0700; (818)842-6900, 787-6900, 454-1919, 887-7900. Intelligent fun, good ratio of women, local events, contests, 1GB library. Instant access. [Exp. #134.]

Mr. Wonderful's Lair. (213)261-8055, (818)451-

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BBS Spotlight

By John Wolcott

Party Online!

A great find among subscription BBSes is Miller's Party Board. Located in Culver City, this is a full-featured BBS that offers a double-dose of online help. The folks at Miller's are more than happy to help acquaint new users with the system as well as provide the latest and greatest BBS tricks available.

You'll get speedy access to this BBS with thirty-two incoming phone lines supported by AT&T Paradine and Infotel 1441 modems at 14,400 baud. Other hardware includes an IBM-compatible 486DX2/66 computer with a six-disc changer to provide shareware files on CD-ROM. The software running the system is MajorBBS v6.21F.

When logging on for the first time, you'll be asked some basic registration questions and you may choose an alias. After a sysop has verified the information you've provided, you will be granted trial access to peruse the system. The next time you log on, you're greeted with some system information bulletins that not only offer, but actually recommend that you take a tour of the BBS with an official tour guide; the philosophy being that even if you're an experienced BBS user, there will be features in this action-packed BBS that you'll miss out on if you don't get shown around.

Sysop Jack Stern, alias Miller Lite, started Miller's Party Board to provide a friendly and uncensored atmosphere for fellow BBS addicts. You will find almost any feature you could ask for, including chat, networked and local electronic mail, public message forums, a file download library, online shopping and fax services, games, WorldLink chat and mail, system information, news, and technical support. Don't allow lack of experience to preclude you from exploring these offerings. I found the system easy to navigate, and there was a friendly and helpful staff at the ready with explanations.

The chat feature enables you to communicate with other connected users on a real-time basis. Both group chat and private chat will allow you to share your computer and personal experiences with others. There is a very social atmosphere with clever commands for sending messages to others. A complete list of these commands is available from within chat by typing "/a list" with your Print From Screen command turned on. You'll want to have this list ready for future chat action. And for a new and different chat experience, check out WorldLink chat. Depending upon time of day and user demand, the system is linked for chat with ten to two hundred different BBSes nationwide, exploding the typical confines of local user membership and allowing intellectual and social interaction with BBS users across the country.

Electronic mail is a great way to stay in touch with the computer world. Miller's Party Board does this on a grand scale with MajorLink to allow access to a wide range of users, providing an expanse of knowledge from the computer world at large.

Public message forums provide discussions on most any topic you can imagine. You may express political opinions or share your favorite jokes with other users, maybe even discuss food and fitness. It's all here, ready for your input.

The file library contains files for several computer platforms. A rare find among today's popular BBSes is Mac and Amiga files. With six shareware CD-ROMs online, you will be able to find an application to suit most any need. Over ten thousand files are available for your download pleasure. Files that are not on CD-ROM have been virus-scanned for user protection. All popular download protocols are supported. Online shopping is under development and will allow you to order popular software titles.

Faxing from the local copy shop or corner drugstore is now old news. Faxing from a BBS is here! Just specify the telephone number to send the fax to and upload your fax information.

Looking for an online service with the features YOU want?

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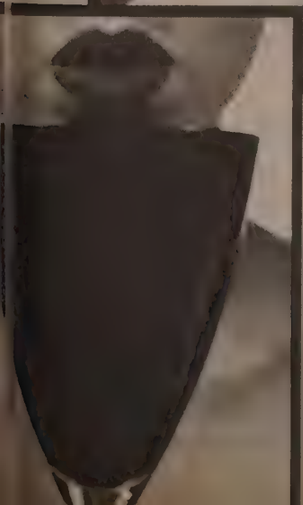

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0874. 24 hrs., up to 28,800. Internet, echomail, games, shareware, adult, 12 CDs. Free 14-day account. Sysop: Mr. Wonderful. [Exp. #133.]

Prism. (310)799-0380; (714)454-9242, 638-7249, 642-6256. 8-N-1, 24 hrs., 300–28,800. 32 lines, 4.5GB. Internet, MajorNet, TradeWars 2002, adult areas, social events. Instant access. [Exp. #134.]

The Rising Phoenix. (310)425-7404, 599-7448, 529-7421; (714)255-1823, 635-5058, 832-6032, 995-3010. 300–14,400. 24 lines. Family board, files, chat, TradeWars 2002, trivia, games. Free trial. [Exp. #133.]

Southland BBS. (213)962-8191, (818)793-9108. 14,400. Internet email, Usenet newsgroups, Linux, chat/MUD, MatchMaker (17K+ users). Sysop: Joseph Gomez. [Exp. #134.]

US Pompeii. (213)878-2801; local numbers for 310, 805, and 818. 8-N-1, 24 hrs., 14,400. Local/international email, Internet, forums, chatlinks. MatchMaker, files, 21+. One month free. [Exp. #134.]

213

BBS. (213)934-6026. 24 hrs., 1200–9600. Message center, bulletin boards, horse racing data. Type in: FREE (ID) CALLER (password). [Exp. #132.]

BBS Central. (213)464-0200. 24 hrs., 28,800. Multiline, multi-interest, Windows, free Excalibur users terminal. Free 15 min./day. [Exp. #134.]

Biker Network. (213)644-0391. 8-N-1, up to 14,400. Biker GIFs, messages, for sale, lost/found, Mac shareware, CD-ROM research. Sysop: Al Walker. [Exp. #134.]

The Career Network BBS. (213)629-1472, 933-4999. 8-N-1, 7:30 am–1:30 pm, 1200/2400/9600. Hundreds of JOBS! throughout the US; your resume can reach 200+ employers monthly. Sysop: Steven McCormick. [Exp. #134.]

Janin BBS. (213)564-0995. 8-N-1, 24 hrs., 1200–14,400. Amateur radio discussion and Internet email. Fee: details online. [Exp. #134.]

LA Collect. (213)661-6299. 8-N-1, 24 hrs., up to 14,400. Civic network, serious talk, new BBS technology, all welcome. Free. Sysop: Roger Eaton. [Exp. #133.]

Mark'System BBS. (213)758-0684. 8-N-1, 24 hrs., up to 14,400. Music, musicians, Mopars, technology, and controversial topics! Free limited access. Sysop: Mark S. Lewis. [Exp. #134.]

OPAMP Online. (213)957-6915. 24 hrs., Technical book catalog, ChapterSearch, computer and other technical disciplines. Free. [Exp. #134.]

Pacific Online. (213)344-4444 @ 2400, 344-4445 @ 14,400. 8-N-1, 24 hrs. 10 lines. Internet email, files, 5GB system, multiplayer games, more. Free/fee. Sysop: Steve Jackson. [Exp. #133.]

The Venture Capital Exchange BBS. (213)623-0887. 8-N-1, 28,800. Home of Evans 1000 Venture Capital Directory, investment proposals, barter deals, more. No fee. Sysop: Mervin Evans. [Exp. #134.]

310

Adult Access BBS. (310)657-5775. 24 hrs., 28,800. Multiline, multi-interest, adult XXX GIFs, free Excalibur users terminal (Windows). Free 15 min./day. [Exp. #134.]

BBS Spotlight cont.

The Games selection from the menu will put you in touch with popular online games such as Backgammon and Tradewarz 2002. The major attraction on Miller's is MajorMud from Westcoast Creations. Users flock in droves to experience fantasy role-playing in this new online game. This is definitely worth some investigation.

System Information will direct you to important system bulletins including subscription information and technical support. Plenty of Miller's information is contained here. Subscription rates vary from $10.00 to $20.00 per month depending upon your BBS needs.

Miller's Party Board can be reached by calling (310)815-0117 with standard modem protocols of 8-N-1. There are also many numbers from other calling areas to make your call local or less expensive. Give Miller's a call for a great BBS experience. ■

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Best & Worst #2. (310)927-5016. C64 & C128 specific; Bell Gardens. Sysop: Curtis Boatright. [Exp. #132.]

Chaos Online. (310)318-5089, 318-2289. Up to 14,400. Windows shareware, adult GIFs, games, chat, messages, free downloads. [Exp. #134.]

CyberKorea BBS. (310)926-1899. Korean files, Badookgo, forums, Internet email. No fee. [Exp. #133.]

The Dark Crystal BBS. (310)522-9633. 8-N-1, 24 hrs., Message area, shareware, CD-ROMs, Sci-Fi news, Amiga news, adult area. Free. Sysop: Jesus Muniga. [Exp. #134.]

Fantasia BBS. (310)986-9705. 8-N-1, 24 hrs., 2400–28,800. The Carpool lane on the Information Superhighway, Internet, chat, games. Free/fee. Sysop: Brian Andrus. [Exp. #134.]

France OnLine™. (310)441-7280. 24 hrs., Eight lines. French-speaking BBS. Chat, forums, news from France, calendar. $5/mo. [Exp. #132.]

Gato's Lair BBS. (310)396-9744. 24 hrs., 8-N-1, 2400–28,800. Net echos, online games, email, adult sections, 10:1 ratio. Free. [Exp. #133.]

Health Online. (310)831-6775. 8-N-1, 24 hrs., 1200–28,800. For healthcare professionals, caregivers, patients, people interested in their own health; files. Free. Sysops: Tom and Susan Dorsey. [Exp. #133.]

Independent Filmmakers Forum. (310)425-0012. 8-N-1, 24 hrs., 2400/9600/14,400. Online networking for independents, forums, chat, job listings, free screening passes, and more. Free trial. Sysop: Philip Matuzic. [Exp. #134.]

Interactive Shopping Network. (310)445-1500. 24 hrs., 1200–14,400. Shop for computer hardware and software, furniture, classifieds with photos. Free except classifieds. [Exp. #132.]

La Mirada's The Modems Delight BBS. (310)944-1221. 24 hrs., 1200–16,800. Multiinterest files, doors, games, fun, Qmail4, echomail, FidoNet, RimeNet. Sysop: Ron Dishon. [Exp. #132.]

Mac-Hac'ers BBS. (310)549-9640, 549-9664. 8-N-1, 24 hrs., 300–16,800. All computers, library, technical area, international mail, large graphics area, much more. Free. Sysop: Bud Grove. [Exp. #134.]

Manhattan Online. (310)374-9994. 28,800. Four lines. Windows, DOS, Mac, OS/2, FidoNet, Internet, CD-ROM sales. Free. Sysop: Paul Swanno. [Exp. #133.]

The Möbius Strip. (310)599-7225. 24 hrs., 300–14,400. Registered WWIV board, strong message base, onliners, RPG, instant access. Free. [Exp. #134.]

Mommadillo's BBS And Breakfast. (310)438-7830. 24 hrs. v.42bis WWIVNet @1175. Games, files, good conversation for your online enjoyment. [Exp. #133.]

Moroni BBS. (310)392-3981. 24 hrs., 300/1200/ 2400/9600. Hundreds of Mormon church-related documents plus 650MB of shareware. Free. [Exp. #133.]

One World. (310)372-0987. Ecology, gardening, health, alternative news, international network. Free. [Exp. #134.]

Original Apple Corps BBS. (310)454-4660. Apple II support. Sysop: Ed Molina. [Exp. #134.]

Sable OnLine! (310)768-8372. 1200–14,400. Internet, FidoNet, multiline chat, CD-ROMs online, ASP approved BBS. [Exp. #133.]

Servant Christian BBS. (310)371-2770, 371-3130, 371-0251. 14,400. Three lines. A modem ministry for both Macintosh and Windows users. Administrator: Doug Wade. [Exp. #134.]

South Bay Apple Computer Club BBS. (310)538-1913. 8-N-1, 24 hrs., 1200–14,400. Apple II support and free Internet email access. No fee. [Exp. #134.]

South Bay Apple Mac User Group BBS. (310)792-8083, 792-0264. 24 hrs., Multiline, FirstClass. Administrator: Dr. Dave. [Exp. #134.]

Starfleet HQ II BBS. (310)422-8178. 8-N-1, 24 hrs., 300–14,400. Online games, VNET/IceNet/others, Star Trek news/discussions. No fees. Sysop: Rodney Palmer. [Exp. #133.]

Upper Transylvania BBS. (310)515-6843, 515-6953. 24 hrs., 1200–28,800. 12 family-oriented CDs online, AGAPE Christian Network hub. Free. Sysop: Ron Hoffman. [Exp. #134.]

408

Garlique Graphics Image Center. (408)847-0665, 847-5076. Adult GIFs, Internet newsgroups, shareware, adult CD, instant access. Excellence online. [Exp. #134.]

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3 Systems In One. (714)969-9624. 8-N-1, 24 hrs., 300–28,800. 14 lines. ANSI and RIP, real estate info, MajorNet forums, email, chat, games. Sysop: Doug Campbell. [Exp. #134.]

Budapest BBS. (714)895-4885. 8-N-1, 24 hrs., 1200–14,400. Bilingual, writers, news, politics, history, anthropology, legends, myths, books, messages. [Exp. #134.]

Calypso Online Services. (714)366-1355. 24 hrs., 28,800. 25 lines. An exciting new board including Internet and adult files. Free trial period/subscription. [Exp. #132.]

The CAT BBS. (714)979-8333. Santa Ana. Sysop: Bob Blakeley. [Exp. #132.]

Check Six BBS. (714)362-8299. 8-N-1, 1200–28,800. Five lines. Flight simulation msgs. and files, Internet, Usenet, SimNet. Limited free access. Sysop: Patrick Gost. [Exp. #134.]

Cloud Lake BBS. (714)768-3585, 830-9384. 8-N-1, 24 hrs., 2400–28,800. 50,000+ files. Science, astronomy, engineering, programming, Windows, DOS, games, and more. Sysop: Ed Barnes. [Exp. #133.]

Construction Online. (714)378-4779. 8-N-1, 2400–14,400. Building products, email, forums, building permits; after 6 pm chat, games. Sysop: Kathy Weaver. [Exp. #132.]

Crossroads. (714)724-1041. Up to 28,800. 1.2GB online, CD-ROM, adult files. Full access for free. [Exp. #134.]

CWI-BBS. (714)870-1033. 8-N-1, 24 hrs., 2400–14,400. Entire CWI disk catalog plus six CD-ROMs. Free browse, friendly chat. [Exp. #132.]

Dizzyland. (714)637-7657. 24 hrs., 2400–19,200. Many networks, APOGEE shareware direct file section, online games. No fee. [Exp. #132.]

Eat My Shorts! BBS. (714)827-7776. 8-N-1, 24 hrs., 28,800. 1.2GB adult, online games, and netmail. [Exp. #133.]

Global BBS. (714)373-1544. 24 hrs., 2400–14,400. For political junkies! Internet, FidoNet, VirtualNet. Politicians and organizations online! [Exp. #134.]

Graphics Development Association. (714)651-1812. 8-N-1, 24 hrs., 28,800. Adult GIF, RIP, Windows, Amiga, RayTracing, BMP, CAD. $15/yr., parts free. [Exp. #134.]

The Great Escape! (714)631-5112, 894-4329. 10 lines. Nationwide chat, multiuser games, War-of-Worlds, Internet email, more. Free trial. [Exp. #133.]

Happy Trails BBS. (714)547-0719. 24 hrs., 28,800. Seven lines. FidoNet, Internet, UChat, QSO, 2GB downloads. Free trial. Sysop: Don Inglehart. [Exp. #133.]

Hell's Door BBS. (714)891-6083. 8-N-1, 24 hrs., up to 28,800. Features to place this BBS above the rest. Free. Sysop: TNT. [Exp. #134.]

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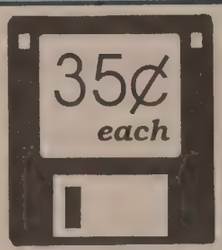

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Infinity BBS. (714)898-3236. 8-N-1, 24 hrs., 300–14,400. Internet, Usenet, satellite fed shareware, games, teleconference, call today! Sysop: Dan Minear (suitcase). [Exp. #134.]

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Junior Flight Deck BBS. (714)549-0472. Santa Ana. Sysop: Ted Stein. [Exp. #132.]

L.A. Classifieds. (714)548-2110. 14,400. Free private party classifieds, matchmaker, chat, photos. Free access. Sysop: Jerry Macoy. [Exp. #133.]

Midnight Jungle BBS. (714)280-1503. 8-N-1, 24 hrs., 14,400. Multinode. Chat, six CD-ROMs, adult areas, Internet access, games. Basic access free. Sysop: Chieftain. [Exp. #134.]

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818

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Blazin' Bytes BBS. (818)776-2777. 16 lines. Games, pubs/SIGs, chat, warm family-style adult board, women welcome. Sysop: Barbara Mallut. [Exp. #133.]

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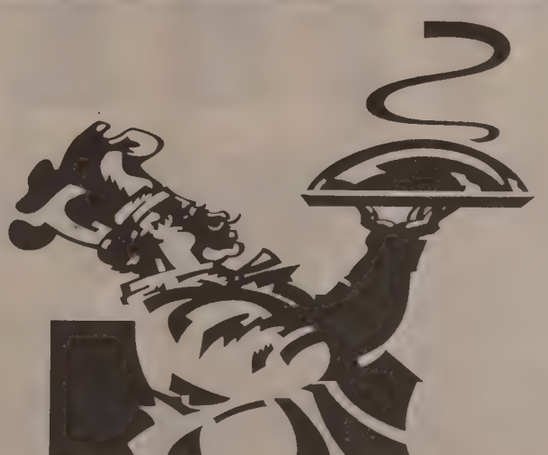

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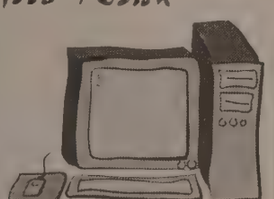

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The Galaxy-II BBS. (818)706-0130. Up to 28,800. Three lines. Supports Galaxy-II game. All gamers welcome, LORD, Assassin, more. Free and free. Sysop: Brett Tondreau. [Exp. #134.]

Giftshoppe BBS. (818)989-1975. 24 hrs., 2400– 14,400. Eight lines. Games, matchmaker, 8GB adult GIFs, ThrobNet, HotNet, WildNet, FidoNet. Sysop: Dan Bauer. [Exp. #133.]

International TradeLine. (818)843-4102. 24 hrs., 2400–14,400. International trade, NTDB/FTI access, market research, computer software, business contacts. [Exp. #132.]

InvestorLink. (818)331-4511. 8-N-1, 24 hrs., 9600. Stocks, real estate, daily commodity prices, real-time news, more. $5/mo. Sysop: Steve Painter. [Exp. #134.]

The Labyrinth BBS. (818)794-0490. 8-N-1, 24 hrs., 14,400. Files, messaging, FREE Internet, user loads, doors, QWK mail. Free. [Exp. #133.]

The Labyrinth Shareware Registration System. (818)792-2523. 8-N-1, 24 hrs., 2400–14,400. Shareware for free! Register online. Tech support by authors. Sysop: Chris Schurr. [Exp. #133.]

Free-Net. (818)776-0000. 8-N-1, 24 hrs., up to 14400. 16 lines. Nonprofit community network with extensive Internet connections: newsgroups, gopher, mail; and more. $10/year. Sysop: Alex Jalinous. [Exp. 12.]

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On The Bright Side—Agoraphobia Support Board. (818)776-2781. 24 hrs., For those with agoraphobia/panic disorders, family, friends, caregivers, medical community; caring. [Exp. #133.]

The Open Mind Discussion Club BBS. (818)758-9348. 24 hrs., 300–14,400. Current and topical event discussions, all computers welcome. No fees. Sysop: Bill Greenland. [Exp. #134.]

The SLATE BBS. (818)763-9172. 8-N-1, 24 hrs., 300–14,400. Sports, law, tons of everything, files, original games, and more. Free. Sysop: Robbie Reed. [Exp. #134.]

SONiC Dreams BBS. (818)831-6052. 24 hrs., 1200–28,800. Online games, files, echoes. No fee. [Exp. #134.]

Southland BBS. (818)793-9108. 14,400. Internet email, Usenet newsgroups, Linux, MUD, and chat. Sysop: Joseph Gomez. [Exp. #132.]

Sugar Free BBS! Diabetes Support Board. (818)776-2779. 24 hrs., For those with diabetes, family, friends, caregivers, medical community; caring. Free. [Exp. #133.]

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Valley West Online BBS. (818)888-8419. 8-N-1, 24 hrs., 14,400. Six lines. 70+ games, 2GB, Fun! Donations based. [Exp. #134.]

Wizardry BBS. (818)222-4444. 2400–14,400. Online games, downloads, uploads, adult GIF and text files. Free. [Exp. #134.]

Xtasy. (818)330-7596. 5+GB adult GIFs, AVIs; 3+GB shareware; fantasy sport leagues w/daily stats. [Exp. #132.]

909

CafeXpresso: An Electronic BBS Coffeehouse. (909)944-3336. 8-N-1, 24 hrs., 14,400. Writers, readers, artists, the coffeehouse culture. Sysop: Joseph Valentinetti. [Exp. #133.]

Classifieds Online. (909)599-6153. 8-N-1, 24 hrs., 2400–14,400. Read and enter your private party ads FREE! Cars to computers to real estate. New ads daily. Sysop: Al Graham. [Exp. #132.]

CompuShopping Net. (909)464-2750. 24 hrs., 2400–14,400. Lowest price CD-ROM titles sale, free download CD catalog with PCX picture. [Exp. #134.]

The Dark Tower. (909)598-0036. 8-N-1, 24 hrs., 1200–28,800. Nine CD-ROM drives, huge adult section, Usenets, free Internet email. [Exp. #134.]

Data Connection. (909)698-7257. 8-N-1, 24 hrs., 28,800. Eight lines. News, weather, Planet Connect feeds, 12 CDs, adult. Fee. Sysop: Dennis J. Clark. [Exp. #134.]

Dragon's Lair BBS. (909)794-4340. 8-N-1, 24 hrs., 1200–14,400. CD-ROM, large file base, FidoNet, WWIVnet, ICEnet, many echoes, msg. bases. Free access. Sysop: Hawkeye. [Exp. #134.]

electronic Gourmet Guide (eGG). (909)338-5422. 8-N-1, 24 hrs., up to 28,800. The eGG is an online food magazine and chef's resource center. Guests free. Sysop: T. Way and K. Heyhoe. [Exp. #134.]

The French Connection BBS. (909)428-7648. 24 hrs. Eight lines. California's largest adults only BBS. View GIFs online in Windows. Sysop: Christopher A. Moss. [Exp. #133.]

Inland Sports BBS. (909)789-2978. 8-N-1, 24 hrs., 1200–28,800. Sports conferences, many echoes, CD-ROM, 10,000+ files. Free access. [Exp. #134.]

Legend Graphics Online. (909)689-9229. 24 hrs. 16 lines. Super VGA photo images, MoviePICs, huge adults-only file areas. [Exp. #134.]

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Pleasure Dome BBS. (909)628-7154. 24 hrs., 2400–14,400. True Windows GUI, multitasking, #1 adult BBS, 8GB+. Sysop: Kristopher M. Morales. [Exp. #134.]

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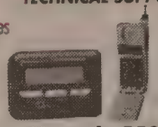

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DESKTOP MEMORY

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IBM:			
PS/1(ALL)	169	339	559
433SX, SL, 435SX, SL	169	339	559
PREMIER PS/2			
76, 77, 56	169	339	559
57 ULTIMEDIA M77	169	339	559
PS/1 WELCOME(ALL)	169	339	559
PS/1 CONSULTANT	169	339	559
PS/1 ESSENTIAL	169	339	559
PS/1 ADVISOR	169	339	559
PS/2 50, 60, 70, 95XP	169	339	559
COMPAQ:			
PROLINEA MT 4/33 4/66, 4/50, 4/66	165	329	559
PRESARIO 486/33 486DX2/66	165	329	559
PRESARIO 600, 600, 400 SERIES	165	329	559
PROLIANT (ALL)	165	329	559
DESKPRO (ALL)		CALL	
AST:			
PREMMIA 4/33, 486 50d, 66d	169	339	
ADVANTAGE 1 PLUS 486 SERIES	155	305	479
ADVANTAGE 1 PRO 486/33GA, 5X25	155	305	479
BRAVO 486LP, LCD, LC SERIES	155	305	479
PREMIUM II-SX, SX16, SX20	155	305	479
PREMIUM 486 (ALL)		CALL	
APPLE:			
QUADRA 700, 900, 950		CALL	
QUADRA 800, 840AV		CALL	
QUADRA 605, 610, 650		CALL	
CENTRIS 610, 650, 660 AV	155	289	479
PERFORMA 450, 460, 466, 467, 475, 550, 600	155	289	479
DELL:			
PRECISION 486	155	289	479
ZENITH:			
Z486/25E		CALL	
Z-SERVER (ALL)		CALL	
Z-STATION 190		CALL	

NOTEBOOK MEMORY

	4MB	8MB	16MB	32MB
TOSHIBA:				
T1950/1900/T1900CT	195	389	745	
T4700 (NEW), T4800 (NEW)	195	389	745	
T6400/6600	195	389	745	1395
T1850/C, 1800, 2200SX	195	339		
T2000SXE	195	339		
PROTEGE 3400/2400	195	389	745	
IBM:				
THINKPAD 755/c,	199	389	839	1495
THINKPAD 750c, 300	205	349	699	
THINKPAD 700, 720, CL57SX	195	365		
THINKPAD 500	209	379		
THINKPAD 350/C	195	339	619	
PS/NOTE 2618	195	339	585	
PS/NOTE 182, N82	209	349		
COMPAQ:				
CONCERTO 425, 433	205	379	689	
CONTURA 4/25, C, CX	205	349	679	
LTELITE 4/25, C	209	379		
COMPAQ AERO	205	359	CALL	
NEC:				
ULTRALITE VERSA E/N/V (3.3V)	209	379	779	
ULTRALITE III, SL, 25C	205	369		
ULTRALITE VERSA S-SERIES	249	459	950	
ZENITH:				
Z-STAR 433VL		379		
Z-NOTE	205	379	679	
Z-LITE 425LSUB	119(2MB)			
AST:				
ASENTIA 900N	219		695	
POWEREXEC 486SL/33	205		679	
BRAVO NB/EXPLORER	205		649	
PEN EXEC	129(2MB)		209(4MB)	
T.I.				
TRAVELMATE TI 4000E	205		895	
TRAVELMATE TI 4000M (NEW)		205	895	
TRAVELMATE TI3000 (2MG)	99			
TRAVELMATE TI2000 (1MG)	79			
APPLE:				
POWERBOOK 520,/C, 540,/C229	409		779	
POWER PC	155	299	529	
POWERBOOK 140, 145B, 170, 180, 160, 165, 180C, 165C	209	CALL		
EVEREX:				
STEPNOTE	205		619	

	4MB	8MB	16MB	32MB
ACER:				
ACERNOTE 750, 735, 769	219	409	699	
TWINHEAD:				
SLIMNOTE E 486DX	209		749	
SLIMNOTE 1/5 SERIES	209		749	
PACKARD BELL:				
STATESMAN	209	379		
AT&T:				
AT&T SAFARI 3181	209	409	789	
AT&T SAFARI 3151	229			
SAGER:				
3600		395	695	1295
6500	209		695	
7500	209	395	695	1295
SHARP:				
7700/7750/8150/8650	209		749	
SAMSUNG:				
NOTEMASTER 16/25	119(2MB)	219(4MB)	339(6MB)	
ZEOS:				
COLORNOTE	205		689	
FREESTYLE	205		689	
MIDWEST MICRO:				
ELITE SOUND BOOK	215	495	CALL	
GATEWAY:				
COLORBOOK	209		689	
HANDBOOK	209		689	
NOMAD/NOMAD N	229		895	
AMBRA:				
NC 425SL	205	349		
N100	205	379	769	CALL
SN SERIES	205		669	
ALTIMA:				
VIRAGE		205	649	
LSX	139	205		
NB486		205	649	
CANON:				
INNOVA	129(2MB)	205(4MB)	349(8MB)	
INNOVA BOOK 10		205	669(16MB)	
NOTEJET NOTEBOOK	129(2MB)	205(4MB)	349(8MB)	
NOTEJET 486(BN22/BN100/BN120)	195		355(8MB)	
EPSON:				
ACTION NOTE 500C	209			
NBS3	209			
NBSL	209	339		

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PANASONIC:				
CF380/480	119	205	309(6MB)	
CF170/270/370	129			CALL
CTX:				
EZBOOK	205	385		
COMPAL:				
TS3800	195	385	735	(20MB)
ALR:				
FLYER 32XX	75(1MB)	205	595	
DELL:				
LATTITUDE XP SERIES	249	469	949	
LATTITUDE 433	195		875	
32N+/325N/325/NC	105(2MB)			

PRINTER MEMORY

	2MB	4MB	8MB
HEWLETT PACKARD:			
HP 4, 4M	79	159	329
HP 4P, 4MP	79	145	295
HP 4L, ML (1MG ONLY)	$55		
HP 550, C, 560, C (256K ONLY)	$45		
HP II,IID	105	159	
HP III, IIIP	105	159	
OKIDATA:			
400	105		
400E/4 10E	119	209	
PANASONIC:			
KX 4410/4430	105	169	
KX 4420/4450	139	219	
KX 4400/5400	145	209	
KX 4440/5410	145	249	
EPSON ACTION LASER:			
1500, 1000	129		
APPLE:			
PRO 810	219	449	
CYRIX FASTMATH			
MATH CO-PROCESSOR			
CYRIX DX-40		49	
CYRIX SX-33		45	

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USER GROUPS

ACCESS

Access Developers Group. Meetings: 3rd Tues., 6:15 pm, Microsoft Orange County Office, 3 Park Plaza, Ste. 1800, Irvine (Jamboree at Main, next to Hyatt Regency). Meetings include formal presentations, tips and tricks, and Q&A sessions. Call: Michie Kobayashi, (714)770-0400, ex. 2217. [Exp. #134.]

AMIGA

Amiga Users Group Of Long Beach. Meetings: 1st Thurs., 7:00 pm, Fire Station Bldg., 5373 E. Second St., Belmont Shores. All persons with an interest in the Amiga computer welcome. Free. [Exp. #137.]

ATUG—San Gabriel Valley. Meetings: last Tues., 7:00 pm, Michelangelo's Pizza, San Dimas; 3rd Sat., 11:00 am, 1st Southern Baptist Church, Temple City. Call: Steve Ward, (818)285-6424. [Exp. #132.]

SFVAUG—San Fernando Valley Amiga User Group. Meetings: 2nd Tues., 7:00 pm, "The Meeting Place" off the Food Court in Fallbrook Mall. Continuing the exploration of the Amiga in the area's most active Amiga Orphan support group. Call: Ernie, (805)526-8252. [Exp. #132.]

APPLE

Champions Of The Mac Proletariat (CHOMP). Meetings: monthly, 7:00 pm, Cal Poly Pomona. Question and answer, raffle of useful software, opportunity to purchase disks. Call: Craig Richards, (909)985-7385 or Mitch Cohen, (909)598-5766. [Exp. #137.]

Original Apple Corps. Meetings: 2nd Sun., West LA area. Apple II and Mac users group. Support for beginners through experts. Call: Fred Duffy, (310)450-3336. [Exp. #137.]

ATARI

All Computer Association Of Orange County. Meetings: 2nd Sun., 1:00 pm, Fullerton Savings, 12860 Euclid Ave., Garden Grove. Supporting Atari, Macintosh, PC, and other computer systems. Call: (714)265-9357. [Exp. #134.]

ATESIG—Atari 8-Bit SIG. Meetings: 145 Surf Pl., Seal Beach. Cooperative user group for model railroad applications. Call: (310)430-5433. [Exp. #134.]

South Bay All Computer Enthusiasts. Meetings: 2nd Tues., 7:30 pm, VFW Hall, 1865 Lomita Blvd., Lomita (1 block W of Western). All skill levels. Call: Danny or Mary, (310)834-0040. [Exp. #137.]

COMMODORE

Commodore Helpers of Long Beach. Meetings: 2nd Sat., 9:00 am., Community Presbyterian Church, 6380 Orange Ave., Long Beach. Call: Bill Davies, (310)599-1913. [Exp. #133.]

Commodore Technical Users Group (C=TUG). Meetings: 4th Sunday, 1:00 pm, Senior Citizen Center, 170 S. Olive Rd., Orange. Public domain library, documents library, and magazine. Software and hardware help. Call: Lou Palush, (714)532-1802. [Exp. #133.]

Orange County Commodore Club. Meetings: 4th Sat., 11:00 am, Costa Mesa Public Library, 1855 Park Ave., Costa Mesa. Call: Mike Moore, (714)668-9715. [Exp. #133.]

San Fernando Valley Commodore 64/128 Users Group. Meetings: 1st Tues., 7:00 pm, Balboa Park Recreation Center, Rm. 2, Balboa and Burbank blvds., Encino. Call: Paul Kroll, (818)892-3859. [Exp. #137.]

South Bay Commodore Users Group. Meetings: 3rd Thurs., 7:00 pm, SCE Generating Station, 1100 Harbor Dr. (across from King Yacht Harbor), conference room, Redondo Beach. Support for 64/128 computers; receive or exchange information on programs, applications, or hardware. Call: Dave, (310)324-8357. [Exp. #132.]

Southern California Commodore Users Group. Meetings: 3rd Tue., 7:00 pm, Nazarene Christian School, Rm. 18, 15000 Studebaker Ave., Norwalk. Call: Bill Davies, (310)599-1913. [Exp. #133.]

CORELDRAW

CorelDRAW User Group (independent). Meetings: 2nd Mon., 7:30 pm, Jolly Roger Hotel, 2904 Washington Blvd., Marina Del Rey. Speakers on design and printing, CorelDRAW tutorials, and favorite shareware. Call: Michael, (310)545-1478. [Exp. #132.]

DESKTOP PUBLISHING

Desktop Publishing Support Group And Network Social. Meetings: 1st Mon., 7:00 pm, Covina. Hosted by Planet Data Service Company. $1 w/RSVP, $2 at door. Call: Diane M. Silvers, (818)332-0329. [Exp. #137.]

EPSON

Epson UG/Orange County. QX, PX, CP/M, VALDOCS—support, tech, periodical & disk library, parts. Call: (714)893-3305 or (310)430-4731. [Exp. #132.]

FINALE

Finale User Group (FUGUE). Meetings: 4th Wed., 7:30 pm, Electronic Music Box, 14947 Ventura Blvd., Sherman Oaks. Tips and problem solving. Bring files on disk. SIG of LAMG. Call: Bonnie Janofsky, (213)658-5997. [Exp. #133.]

IBM & COMPATIBLES

All Computer Association Of Orange County. Meetings: 2nd Sun., 1:00 pm, Fullerton Savings, 12860 Euclid Ave., Garden Grove. Supporting Atari, Macintosh, PC, and other computer systems. Call: (714)265-9357. [Exp. #134.]

Cedar Village Users Group. Meetings: 2nd Sun. (3rd if 2nd is holiday), 3:00 pm, Speakers, software, BBS,

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Resources

USER GROUPS cont.

and more. Contact: Tony Barnes, P.O. Box 1141, Bloomington, CA 92316, or modem (909)356-1269. [Exp. #133.]

Fresno PC Users Group. Meetings: 1st Mon., 7:30 pm, Ramada Inn, Conference Room A, 324 E. Shaw Ave., Fresno. Call: (209)496-3974. [Exp. #134.]

Greater South Bay PC User Group. Meetings: 2nd Thurs., 7:30 pm, Torrance Recreation Center located behind the main city library, Torrance. Visitors welcome. Email: (310)335-2799. [Exp. #137.]

Long Beach IBM PC And Compatibles Users Group. Meetings: 3rd Wed., 7:00 pm, Masonic Temple, 5155 E. Pacific Coast Hwy., Long Beach. Novice and experienced welcome, BBS, public domain library, newsletter, SIGs. $25/year, $35 for families. Call: Jim Wells, (310)439-7114. [Exp. #132.]

Los Angeles Computer Society. Meetings: 2nd Tues., 7:00 pm, Culver City High School, 4401 Elenda St., Culver City. Presentations from prominent software and hardware developers and Q&A sessions. Call: (310)471-2726. [Exp. #132.]

MicroLink PC Users Group. Meetings: 1st Sat., 6:00 pm, La Habra Sr. Center, 165 E. La Habra Blvd., La Habra. Friendly group committed to helping people of all skill levels. Call: (714)491-6069. [Exp. #137.]

NOCCC (North Orange County Computer Club). Meetings: 1st Sun. Computer-oriented meetings, SIGs, newsletter, raffles, and BBS. Call: (714)998-8080. [Exp. #137.]

Orange County IBM PC Users Group. Meetings: 2nd Tues., 6:30 pm. Speakers, software, newsletter, BBS. Open to public, all welcome. Call: (714)990-0580. [Exp. #132.]

Pasadena IBM Users Group. Meetings: 3rd Wed., 7:00 pm, 2184 N. Lake Ave., Altadena. Speakers on hardware/software, SIGs, library, newsletter, and BBS. Call: Steve Bass, (818)791-1300. [Exp. #132.]

SCV PC Group. Meetings: 2nd Wed., 7:00 pm, Valencia Town Center Community Room. Call: (805)298-1680. [Exp. #137.]

South Bay All Computer Enthusiasts. Meetings: 2nd Tues., 7:30 pm, VFW Hall, 1865 Lomita Blvd., Lomita (1 block W of Western). All skill levels. Call: Danny or Mary, (310)834-0040. [Exp. #137.]

Southern California Computer Society. Meetings: 4th Tues., 7:00 pm, Farmers & Merchants Bank, 12535 Seal Beach Blvd., Rossmoor. We welcome all who are interested in computers; BBS and newsletter. $15/yr. Call: Hank Burwash, (310)596-9670. [Exp. #132.]

Thousand Oaks Personal Computer Club (TOPCC). Meetings: 4th Thurs., 6:30 pm, Goebel Senior Adult Center, 1385 E. Janss Rd., Thousand Oaks. Call: (805)494-8675. [Exp. #137.]

TUG-NET. Meetings: First four Thurs., 7:00 pm, Glendale Federal Bank, 7119 Topanga Cyn. Blvd., Canoga Park. Ample parking, visitors free. Call: (818)249-1629 or 884-9441. [Exp. #132.]

Valley Computer Club. Meetings: 1st Wed., 7:00 pm, Burbank Board of Realtors Bldg., 2006 W. Magnolia, Burbank. BBS, PD library, SIGs, newsletter. All welcome. Fee, $4. Call: Estella McClintock, (818)848-1948 or Grayce Hruda, (818)842-3707. [Exp. #133.]

Valley IBM Compatible Users Group (VICUG). Meetings: 3rd Fri., 7:00 pm, State Bldg., 6150 Van Nuys Blvd., Van Nuys. Call: Harry Tischler, (818)997-1470. [Exp. #133.]

KAYPRO

KAYOS Kaypro User Group. Meetings: 4th Mon. of even months, 6:00 pm, El Segundo Library, Mariposa and Richmond streets. Call: (310)379-8339. [Exp. #137.]

MACINTOSH

All Computer Association Of Orange County. Meetings: 2nd Sun., 1:00 pm, Fullerton Savings, 12860 Euclid Ave., Garden Grove. Supporting Atari, Macintosh, PC, and other computer systems. Call: (714)265-9357. [Exp. #134.]

Champions Of The Mac Proletariat (CHOMP). Meetings: Thurs. monthly, 7:00 pm, Cal Poly Pomona, grey building near administration building, rm. P2-7. Call: Craig Richards (909)985-7385 or Mitch Cohen, (909)598-5766. [Exp. #137.]

Original Apple Corps. Meetings: 2nd Sun., West LA area. Apple II and Mac user group. Support for beginners through experts. Call: Fred Duffy, (310)450-3336. [Exp. #137.]

South Bay All Computer Enthusiasts. Meetings: 2nd Tues., 7:30 pm, VFW Hall, 1865 Lomita Blvd., Lomita (1 block W of Western). All skill levels. Call: Danny or Mary, (310)834-0040. [Exp. #137.]

South Bay Apple Mac User Group. Meetings: Last Wed., 8:00 pm, El Camino College, MCSC Rm. 100, 16007 Crenshaw Blvd., Torrance. Newsletter, PD library, demos, and raffles. Call: (310)644-3315. [Exp. #137.]

Southern California Macintosh Owners/Users Group (SMOG). Meetings: usually 2nd Sat., 10:00 am, Western Digital Bldg., off 405 Freeway at Irvine Center Dr., Irvine. Speakers, product demos, Q&A, PD disks. All skill levels. Call: Dani Maloy, (909)698-7737. [Exp. #132.]

West Orange County Macintosh User Group (WOCMUG). Meetings: last Tues., 7:00 pm, Emerson Elementary School, 2625 Josie, Long Beach (NE corner of Palo Verde and Willow, just north of 405 fwy at Palo Verde). Come and join with other Mac Users to share knowledge and experiences. Call: Lynn Goodrich (714)892-8910 or Tony Muller (310)493-1240. [Exp. #134.]

NETWORKING

Los Angeles NetWare Users Group (LANet). Meetings: 4th Tues., 6:30 pm, Novell, 11300 W. Olympic Blvd. at Sawtelle, 9th Floor, West LA. Vendor presentations and open forum. Call: SCNUA, 1-800- 532-7268. [Exp. #137.]

Orange County Magic Users Group. Meetings: last Wed., 7:00 pm. For users of Magic client/server tools. Call: Richard Grimm, (714)637-7718. [Exp. #137.]

POWERBUILDER

Los Angeles PowerBuilder User Group. Meetings: 1st Tues., 6:00 pm, Sony Entertainment, 3400 Riverside Dr., Burbank. [Exp. #133.]

PROGRAMMING LANGUAGES

The Software Toolsmiths. Meetings: Last Sat., 10:00 am, Joslyn Center, 339 Sheldon St., El Segundo (except Nov. and Dec.). Discussions and tutorials on programming: C++, Forth, J, Smalltalk, algorithms, etc. Neophytes welcome. Call: John LuValle, (818)797-1820, or Howard Rogers, (310)532-3342. [Exp. #133.]

UNIX

UUASC, The UNIX User's Association Of Southern California. Meetings: 2nd Mon., 7:00 pm, New Horizons Computer Learning Center, 1231 E. Dyer Rd., Santa Ana. Geared to professional and amateur users of all flavors of UNIX, including Linux. Call: Larry, (714)526-4347. [Exp. #132.]

ASSOCIATIONS

International Interactive Communication Society. Meetings: 2nd Mon. Virtual reality, multimedia, info highway issues, and more. Call: (310)313-5664. [Exp. #133.]

Planet Data Service Company's Desktop Publisher's Association. Meetings: 1st Mon., 7:00 pm, Covina. Support group and networking for those in DTP fields. Newsletter, referrals, and more. $50/yr. Call: (818)332-0329. [Exp. #137.]

Software Council Of Southern California. Meetings: usually 4th Wed., 6:00 pm, Long Beach Marriot, Main Ballroom, 4700 Airport Plaza Dr.; also breakfasts and luncheons around SoCal. A nonprofit trade association of software development organizations and companies providing support and services to the local software industry. Call: Bill Manassero, (310)328-0043. [Exp. #132.]

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Free BBS listings are limited to the board's name, phone number, hours, baud rates, parameters, and a ten-word description. Please let our readers know if your BBS is free or requires a fee. Because we have an ongoing problem of boards shutting down without telling us, much to the annoyance of would-be callers and the new phone number's owner alike, we will **delete these listings after they've run three months.** The notice at the end of the listing—Exp. #xxx—refers to the last issue number it will appear in unless renewed.

You can update or renew your listings at any time. If yours is missing, send your listing information to: US Mail should go to: MicroTimes User Groups, 3470 Buskirk Ave., Pleasant Hill, CA 94523. **Faxes** are welcome at (510)934-3958. **Email** can be sent to: microx@well.sf.ca.us, or MCI:MICROTIMES.

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What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its fifteen thousand international members. BMUG supports many special interest groups (SIGs), 18-line Planet BMUG and 11-line BMUG Boston BBSes, a software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 500-page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:30–9:30 (or whenever we finish), on the UC campus. BMUG West and BMUG South are monthly meetings held in San Francisco and San Jose. Check the Announcement Line at (510) 549-2684 ext. 8.

The BMUG Office, 2055 Center Street (a half block from the BART station), is open to the public 8:30 am–4:30 pm. Please come by, say hello, and meet other members.

The BMUG Helpline provides volunteer technical assistance and telephonic handholding for our members. If your question can't be answered on the spot, we try to get you in touch with someone who can help. Improve your Macintosh education and help others by becoming a Helpline volunteer!

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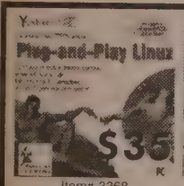

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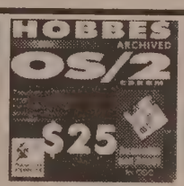

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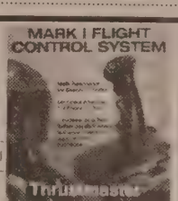

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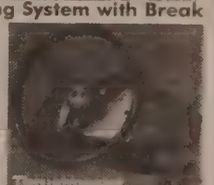

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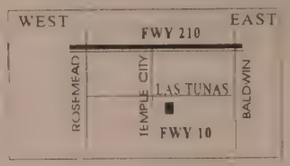

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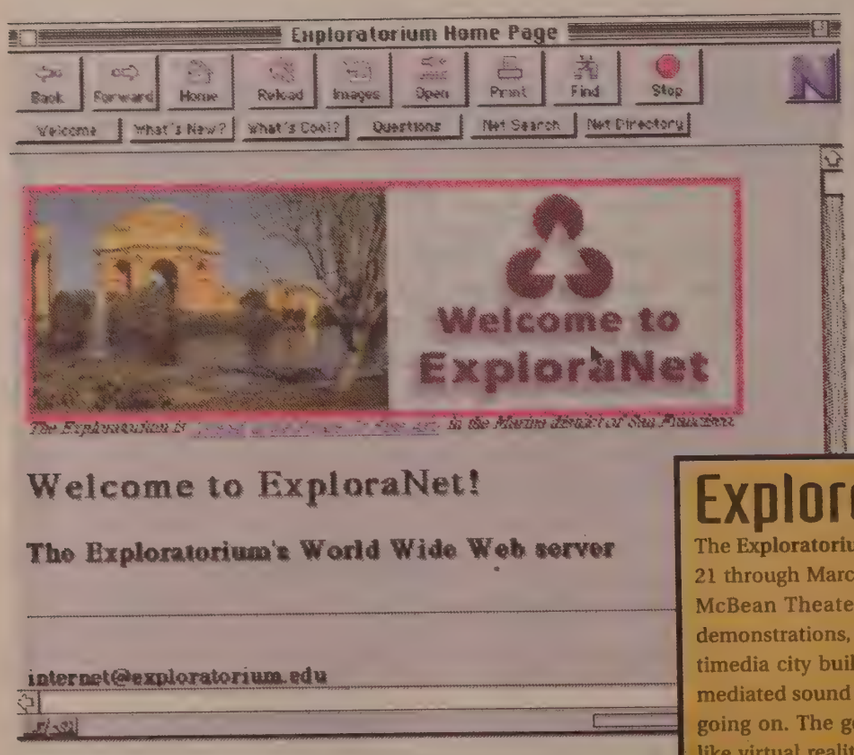
- Gulch Gossip 210
- Multimedia 101
  Meet Marc Canter
  And MediaBand 213

Gulch GOSSIP

by Jonathan E.



Multi-Memories

Abbe Don, interface innovator and all-around multimedia marvel, is exhibiting the new version of her much acclaimed multimedia family memoirs, **We Make Memories**, at not one but two eastern museums. It opens at the National Museum of Jewish American History in Philadelphia on January 18 and at the Atlanta College of Art on January 28. She's particularly stoked about the latter because it's a group exhibition on the theme of families and she was chosen on the basis of content, not technology.

Explore This...

The **Exploratorium** presents **Multimedia Playground '95** from January 21 through March 12. The opening reception is from 2 to 5 pm in the McBean Theater on January 21. There's quite a range of exhibits, demonstrations, and discussions scheduled from a collaborative multimedia city building project by kids using the Internet to computer-mediated sound and video installations to basic explanations of what's going on. The general idea is to demonstrate what those buzzwords like virtual reality, the Internet, World Wide Web, and CD-ROM mean today and their impact on the arts. The hotline for Multimedia Playground '95 is (415)353-0423; for more general Exploratorium information, call (415)561-0360.

The **Multimedia Development Group** presented the first of its white papers, "Going Global: Multimedia Marketing & Distribution," at the Galleria on November 9. **Philippe Bouissou** of Matra Hatchette Multimedia, Paris (France, not Texas), **Hikaru Sasahara** of the Interactive Media Agency in Tokyo and Los Angeles, **Ulrich Seng** of SPEA, Munich, and **Kay Wang** of Point Asia in Taipei and San Rafael, outlined various marketing opportunities in their respective territories and how to realize them.

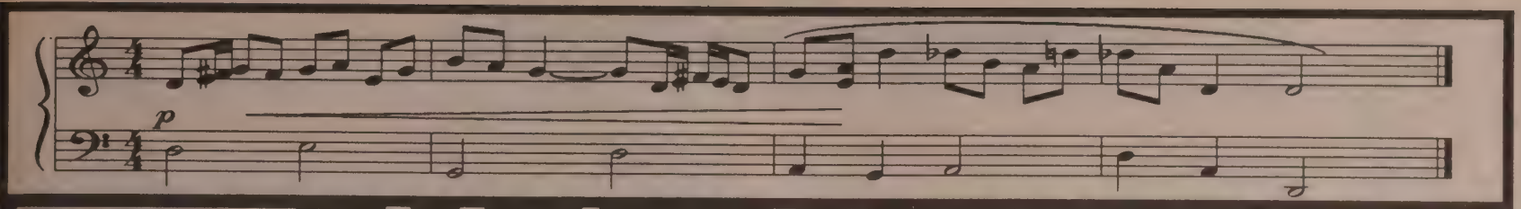
Not surprisingly, the markets are relatively small, but are poised to expand significantly—just like we've been promised so many times in the US. Getting into them, however, could prove tricky without careful advance work, and each territory provides different challenges.

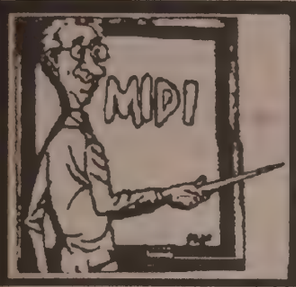
To catch up on the details, get the white paper from the MDG, phone (415)553-2300, fax (415)553-2403, or email info@mdg.org . It isn't cheap at $125 but has a lot of names and addresses that could take a long time to gather on your own. **David Reid**, editor-in-chief of the project, announced that it took forty volunteers nine months to do the work with substantial use of the Internet. All in all it was a serious evening; **Sherry Miller** attempted to count those present with a sense of humor and found only four. I'm not sure whether she included herself.

Meanwhile, **Tim Boyle** has resigned as executive director of the MDG to become a roving ambassador, a position that sounds like a lot more fun. **Val Spangler** is currently acting executive director, but MDG is looking for someone with experience in trade association management to fill the position. MDG's future focus is to determine what the local community of developers need and to establish an on-line presence.

Sound Traffic Control presented a heavy-duty technological event in a completely different aesthetic vein—cigarette-smoking, dark-clad bohemianism—the next night at 174 King Street with

continued...





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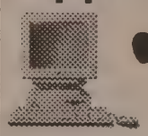
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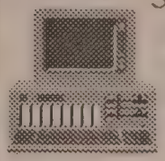
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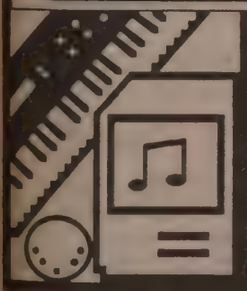

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The Throne of Drones. I've rarely seen so much gear—both the usual mixing boards and a multitude of computers processing sound in various ways. Sonically, the results were impressive—at least until the systems crashed.

Aesthetically, the consensus seemed to be that it was questionable. Having a bunch of musicians play an hour-long drone in an adjoining room with the results transmitted to televisions scattered around the main room did not enthrall many in the crowd of adventurous thrill-seekers. No one in the audience seemed to know—or care—what was going on; alienation of audience from performers is not a hot idea.

Earlier, **Perry Hoberman's Symphonic Appliance System** of PowerBook-controlled kitchen appliances was better received—it reminded me of that classic 1979 electro-punk single "Kitchen Motors" by Crash Course in Science. **Jonah Sharpe**, just back from the U K, later DJed a set of the new jungle sound—I can't say I was impressed, however trendy it is; just give me the reggae bass and leave out the high-speed techno twittering. **DJ Cheb i Sabbah**'s set of primal beats and multiple ambient layers was considerably more enjoyable. Look for DJ Cheb to be doing something interesting with **Sound Traffic Control**'s **Naut Humon** for a party at the Exploratorium during Macworld.

Don't forget to send party invites, veiled threats, shameless self-promoting hype, or boxes of bons-bons via USPS to Jonathan E., SoundSwell, 54 29th St., Richmond, CA 94804; via email to jeve@well.com ; or phone him at (510)236-8453. Note that he has a profound distaste for faxes. ■

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ET CETERA

CANDICE PACHECO'S THE VORTEX, THE ORIGINAL SOUNDTRACK TO **Hyperbole Studio**'s CD-ROM Quantum Gate II, is now out on RGB Records. This is reputed to be the first feature-length soundtrack expressly created for CD-ROM and released as standalone Red Book. The music is Pacheco's distinctive blend of electronics and African and Arabic rhythms —well worth hearing. If you like **D'Cückoo**, this'll please you. ...

Michael Brook, producer of **Nusrat Fateh Ali Khan** and **Khaled** as well as respected 4AD musical artist in his own right, is down at Interval Research doing some sort of interactive music project. Lips are sealed tight regarding details, but it was allowed that he drinks coffee. ...

Another first is the serialization of **Alexander Besher**'s novel, *Rim*, on *HotWired*. Actually, it's a series of firsts: first Web-site serialization of a novel from a major publisher; first novel for Besher, also known as the author of *The Pacific Rim Almanac*; and first novel from HarperCollins West, newest member of the HarperCollins family. The serialization will include some multimedia and hypertext elements such as audio and video interviews with Besher and some sort of glossary of characters and terminology. The question is, will *HotWired* clean up the typos? Besides that, the book is an enjoyable read and intriguing food for thought without being heavy-handed. The movie option has been bought by **Blue Wolf** as a vehicle for **Robin Williams** for release through TriStar. ...

I believe this is yet another first: an online golf tournament organized by **Sherry Huss** for *Computer Life*, using Links software through the Computer Sports Network. I don't understand golf anyway, but virtual golf??? Maybe the prizes of an IBM ThinkPad CsE color notebook and an Aptiva 350 multimedia machine explain part of its appeal.

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MULTIMEDIA 101

Meet Marc Canter And MediaBand

Part 1 of 2

It's hard to believe that Marc Canter ever thought he could "retire and rest" after resigning from MacroMind (now Macromedia) in 1992. It seems like the one thing that would give him a really hard time; his large frame just about vibrates with energy and, as anyone who's seen him in action at a trade show or on a panel can testify, he's a master showman with a performer's sense of presence.

However, that's just what he claims he tried to do before starting Canter Technology, the content-producing company formed to develop more than the mere tools on which his original reputation as a multimedia maven was based.

Meet MediaBand is the first CD-ROM fruit from Canter Technology—and it's a juicy example of the varied approaches Canter and his team bring to interactive music and the video elements that make up its interface. In fact, I consider Meet MediaBand a breakthrough product that illustrates the problems in creating original interactive musical content as well as offering some solutions.

Thanks to the intense hype and frenzy over multimedia and some form of musical interactivity for the past year, leading to a natural desire to see something that fulfills all the extravagant promises, there's some danger that Meet MediaBand will be seen as some sort of destination, while it is really only the first step on a long journey. Canter himself jokes that "I've been selling beta, and people are very happy with my beta because it works. Save it as a collector's item 'cos I'll always autograph it."

More seriously, he acknowledges that MediaBand so far only scratches the surface of possibilities which, for the most part, are based on work done in the early and mid-'80s. Overall, he has a grander vision both for his own artistic endeavours and for the interactive entertainment industry as a whole.

Basically all you can do is to choose from among sixteen versions of the song; there's no real-time interaction.

THE DISC

At the core of Meet MediaBand are two interactive music videos with totally different interfaces designed to suit the individual content of each song. One song, "UnDo Me," has an alternative rock feel and is the search for love of songwriter Kelley Gabriel, once known as Connie Champagne. The interactivity consists of letting you first choose which of four guys she'll go out with, then deciding at each chorus whether she'll act passively or aggressively towards them and their male ways. The mood of the music changes with each choice, and a different portion of the video runs depending on how things are going. If things are going really badly, you can undo the whole thing and try another lover.

It's a pretty simple example of the branching storyline style of interactivity, itself a simple form of interactivity, closer really to selectivity. Basically all you can do is to choose from among sixteen versions of the song; there's no real-time interaction. However, what's impressive is that the details have been thought through to produce a coherent artistic whole; each version of the song works together with its accompanying video and graphic embellishments,

BY JONATHAN E.

and each works in relation to the other versions.

"House Jam" is perhaps less elaborate for the user (as opposed to the programmer), but ultimately more fun. Here there's a fairly simple loop of music with all sorts of images moving about on your screen. As you click, you trigger different samples and animation sequences. "The more you click, the weirder it gets," says Canter, because after you've clicked a few times the software will trigger different effects.

Chris Watkins, aka Preacher Boy of Preacher Boy and the Natural Blues, put all the sounds together to comment on the global multicultural mishmash that some musical genres are becoming. With a little practice, it's possible to develop a fair degree of control and to be able to "perform" your own version of the material in real time. It's not multiuser yet, but it's a defining step forward in making some form of musical expression easier for nonmusicians.

Around these two songs is a collection of other material, ranging from areas where you play the visual elements of the screen and sounds by rolling the mouse around, to parts of Canter's animated business plan, to early QuickTime videos of various MediaBand members, to a Smart Bar with Tony Bove as bartender where several characters pontificate on aspects of new media, to the Tekno Room where visions of the technological multimedia toys of tomorrow await you. There are also straight text documents of some of Canter's proposed schemes. The whole is a fascinating glimpse of and commentary on possible media futures.

Canter's role is essentially that of producer to the rest of the MediaBand; as both Gabriel and Watkins were quick to point out, this is a team effort and there are a total of nine MediaBand members. However, Canter and longtime associate and partner Stuart Sharpe are the guiding originators of the band.

HISTORY AND PHILOSOPHY

Talking with Canter is both an exhilarating and disjointed experience. You don't so much get to interview him as start a conversation, in much the same way as you might start an avalanche or a rockslide with a relatively minor stone's throw. You don't need to wind him up—he just goes.

I began my conversation with him by asking about the apparent irony that in 1994, the year that ambient music was "the big thing" for at least a few minutes in the conventional music business (albeit the alternative/underground side), MediaBand released a musical experience that demands one's active attention rather than staying in the background, an experience that simply doesn't work unless you consciously interact with it. I don't think he ever really answered the question, although he started to, and we returned to the subject when Sharpe appeared midway through the conversation.

Although Canter clearly follows current musical culture enthusiastically, with particular fondness for reggae and interest in new forms of dance music (such as Britain's bhangra and the new jungle style), it also just doesn't matter to him what other trends are going on. He'll certainly accept influences from whatever interests him, but he has the strength of his own artistic convictions to do whatever he feels like doing.

I consider Meet MediaBand a breakthrough product that illustrates the problems in creating original interactive musical content as well as offering some solutions.

One of the things Canter is clearly interested in is establishing his personal history—his press kit includes his personally written three-page life story—and a good part of our conversation covered his earlier years. This may seem like the standard egotism encountered in creative types, but Canter has an obvious generosity of spirit and he's equally interested in explaining the genesis of his ideas as provided by other people. He's eager to make sure that credit due to others is given and that their place in history is noted.

It was a rather rambling and elliptical conversation, not only because of Canter's loquacity and our joint gadfly nature, but because it was also interrupted by the phone ringing, questions being asked by his assistant, people dropping by, and the return of his three boys from their morning's preschool (it also happened to be his twins' third birthday *and* Halloween); all in all it was a charming and casual morning in the home-office that Canter has set up in the old servant's room over the garage behind his house on the edge of the Richmond district of San Francisco.

Canter's answer to my question about the irony of MediaBand contrasted with ambient music began with a deconstruction of ambient but quickly lead into this analysis of his own approach:

"A lot of the way we're doing our music is that it sets this feel, this groove feel, no structure, just vamp on the tonic. In the sense of the actual context of how you're using it, we're trying to get you involved, but in fact all you're doing is 'solos,' and a lot of them are pretty wacky if I do say so myself, noise-type solos like Sonic Youth or the Breeders or whatever on top of this techno thing."

He then immediately launched into a long soliloquy about about his motivation and history: "The thing that's been driving me is my eclectic background; I believe that really it's all about eclecticism. When I was in the Chicago Children's Choir my voice changed and we could go from a doo-wop version of the Mamas and the Papas to a Stravinsky thing to a madrigal back to some Mozart, like Mozart's *Requiem*, back to a spiritual gospel—that was our repertoire and that still is my repertoire. I went from down in the electronic music studio and going up to doing Schumann. So that's my life, that's who I am and I think that's the way our society is."

I didn't even have time to disagree with him about the way our society is before he went on to discuss at length various electronic music artists that have had an effect on him, principally Brian Eno, and Vince Clarke of Depeche Mode and Erasure.

Canter's own background included studying voice and electronic music at Oberlin Conservatory of Music in the mid-'70s, followed by a period at the School of the Art Institute of Chicago studying computer graphics, video synthesis, holograms, and kinetic sculpture. He then moved to New York, where he was part of the No Wave scene of experimental music at night, and during the day built hybrid analog-digital circuits for an opthamology lab that eventually led to custom circuitry for corporate board rooms; he was operating a CMX video-editing suite, and writing the code to control laser light shows, interactive laser disks, and videotext systems. He moved back to Chicago and worked for Bally/Midway, the world's largest videogame company, as an in-house musician. After a while he realized "that special 'tools' were necessary to enable 'normal'

continued on page 218

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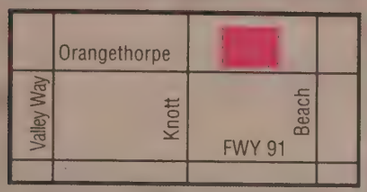

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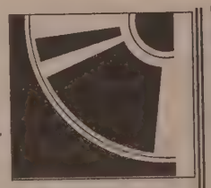

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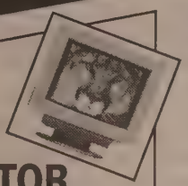

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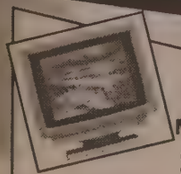

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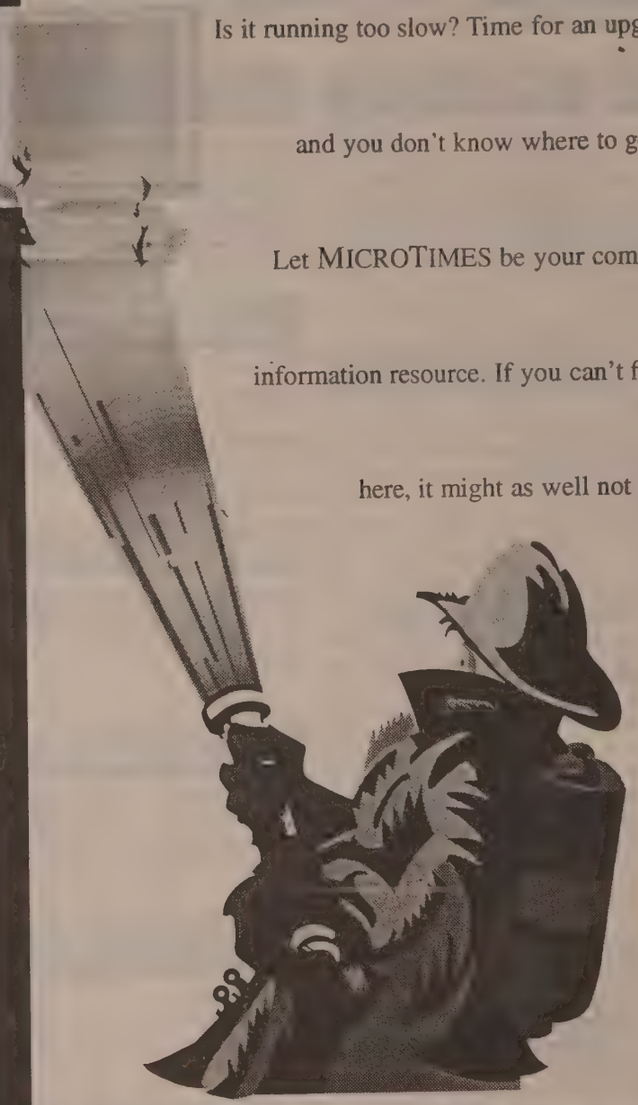

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continued from page 214

nontechnical artists and musicians to create computer-oriented 'content.'" Thus began MacroMind, which eventually moved to San Francisco in 1988.

INTERACTIVE MUSIC

Canter traces the history of interactive, computer-mediated music through Jaron Lanier's "Moondust" for the Commodore 64; to another Commodore 64 product called Music Maker ("a thing you could type notes into and it would actually play back, but it wasn't as dumb as a music construction kit because it had some smarts in it. It was like smarts with data; as I'm playing the thing it knows I've been through it three times so on the fourth time it would go over here."); to "Jam Session" created by Ty Roberts, Ed Bogas, and Steve Capps. Canter identifies the crucial point as "video games are one way to let people have control, but there's a lot of other ways."

Of course any discussion about interactive music eventually gets around to Todd Rundgren; Canter did have a partnership with him for a while. Together they worked out some principles of interactive music that Canter still keeps on a list taped to his computer. The basic tenets they agreed on were that everything is impermanent, not cast in stone; that they're dealing with interactive music, not improvised music; that there should be extensibility to the system; and that there should be conservative use of resources, with reusability of features and templates. After Rundgren split, Canter worked out three further considerations: scalability, adaptability, and compatibility with other systems. Canter sums up his goal as "I want to create a new type of technology, and that technology is multiple-user, real-time performance software."

They began work together on the practical aspects of the task with auditions for the MediaBand, held poolside at San Francisco's Phoenix Hotel in April and May of 1992. They chose three other band members. One of Canter's endearing features is his openness about money and he laughs as he asks, "What's the best way to tell if your bandmembers are loyal? Stop paying them. The first guy to leave was Todd. He has a $700,000 a year overhead that he needed to cover. Anyway, two of the four band members left." ■

To Be Continued.

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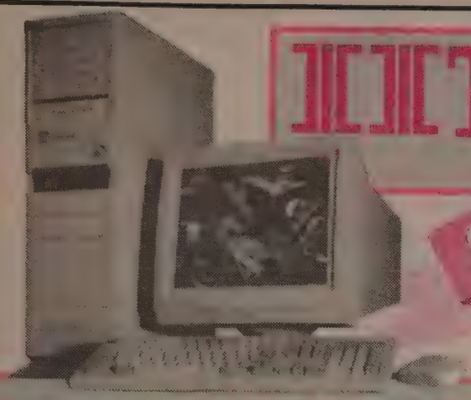

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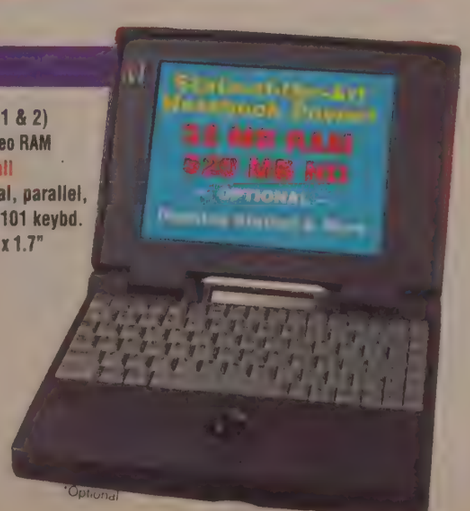

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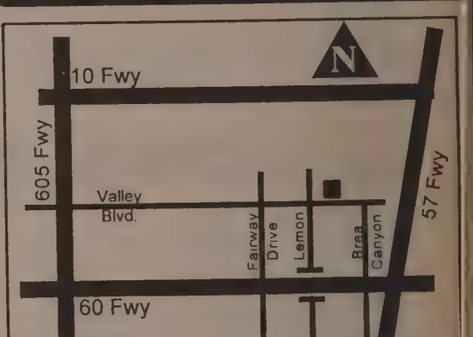

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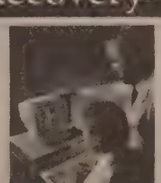

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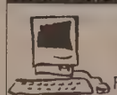

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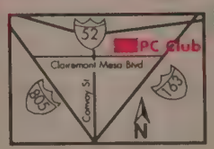

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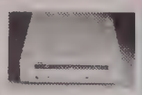

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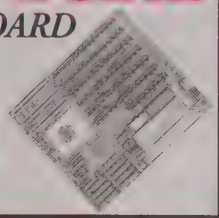

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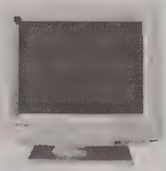

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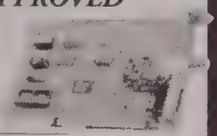

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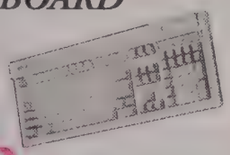

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- 1.44MB Floppy Drive
- Local Bus SVGA w/16M Colors
- Local Bus IDE Controller
- 2S/1P/1G
- 2X Speed CD-ROM
- Sound Blaster 16 Card
- 101 Keyboard
- Mouse
- 14 CD Titles
- J-590 Amplified Speakers
- Monitor Not Included

$1168

intel inside

MULTIMEDIA UPGRADES

Sony 2X Speed with ESS 16 Bit IDE Sound Card — $199

TEAC 4X Speed with Sound Blaster 16 — $299

Toshiba 4X Speed with Sound Blaster 16 SCSI — $399

CREATIVE

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16 Basic	$89
16 SCSI	$159
16 ASP/Multi CD	$186
16 ASP/SCSI 2	$199
32 AWE	$259

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- Panasonic 2X CD ROM
- Sound Blaster 16 MCD
- 14 CD Titles Include: Compton's Interactive Encyclopedia '95, World & US Atlas, etc.

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JS

J320AV 80W	$59
J707 AV 280W	$119
J818 AV 112W Per Channel	$159

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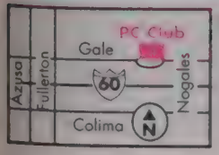
- Toshiba 4X CD ROM 15ms Access Time
- Sound Blaster 16 SCSI
- Speakers
- 14 CD Titles Include: Compton's Interactive Encyclopedia, World & US Atlas, etc.

$449



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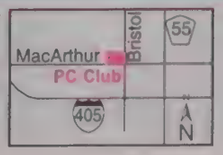
(818) 913-CLUB
(2582)



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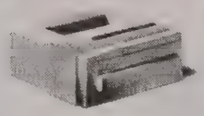

- 300 dpi print resolution
- HP's lowesr priced LaserJet ever
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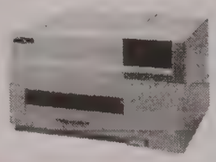
- Equipped with 26 built-in scalable fonts for professional quality documents.

$525.00*

** AFTER $100.00 REBATE*

HP COLOR LASERJET PRINTER



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- Fast color printing at up to 2 pages-per-minute
- Up to 10 pages-per-minute in basic black.

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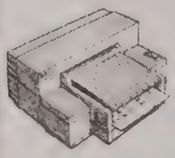
HP LASERJET 4V PRINTER

FAST!

- Features a resolution of 600 dpi
- Prints 16 pages-per-minute; the fastest LaserJet!
- Ability to print on wide-format 11" x 17" paper

1899.00!

HP DESKWRITER / DESKJET 560C INKJET PRINTER



- HP's exclusive built-in ColorSmart technology
- Features resident dual cartridges for black-and-color printing at the same time,
- Clear 600 x 300 dpi black printing
- A variety of internal and scalable fonts!

$539.00!

ARE YOU READY FOR '95!

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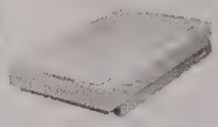

- True 24-bit color, grayscale and text scanning
- Optical resolution of 400 dpi
- 1600 dpi using enhanced resolution technology!

$759.00*

** AFTER $150.00 REBATE*

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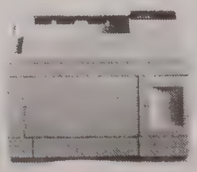

- **600 dots-per-inch output**
- ***New 12 page-per-minute print engine***
- 45 internal scalable typefaces
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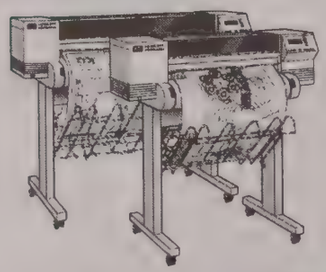
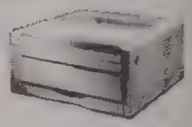


HP LASERJET 4P PRINTER



- Features true 600 x 600 dpi printing
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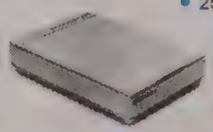

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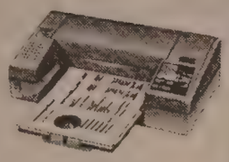
EPSON STYLUS 800 PLUS INKJET PRINTER



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- Two year limited warranty.
- Built-in, out of the box compatibility with Windows

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EPSON ACTIONLASER 1100 LASER PRINTER

- Features a printing resolution of 300 dpi
- 4 ppm print engine
- Includes 22 fonts!

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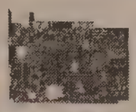

Send and receive data and faxes at speeds up to 14,400 bps. Comes with cables and QuickLink II software for DOS and Windows

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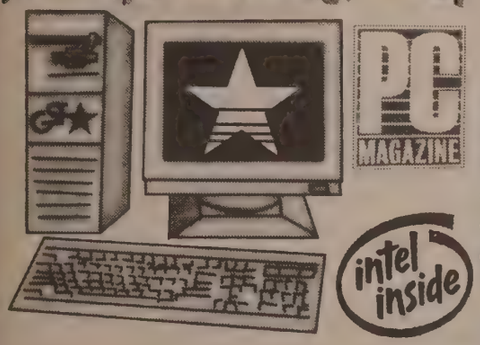
RANKED AS ONE OF THE TOP 150 PC VENDORS! *PC Magazine*



GST MEDIA90 SYSTEM

COMES COMPLETE WITH:

- Intel Pentium 90
- 256k Cache
- ***16MB*** 70NS RAM
- Medium-Tower Case
- 1.44MB Floppy
- ***540MB*** Maxtor HD
- Diamond 64-bit SVGA PCI Video Card w/2MB
- 101 Keyboard
- Everview ***15"*** SVGA NI Monitor
- ***TEAC 4X CD-ROM Drive***
- ***SoundBlaster 16 SCSI-2 Sound Card***

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COMES COMPLETE WITH:

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- 256k Cache
- 4MB RAM
- Mini-Tower Case
- 1.44MB Floppy
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- VL/IDE Controller
- Cirrus Logic VLB Video Card w/1MB
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- Everview 14" SVGA NI Monitor

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- 8MB 70NS RAM
- Medium-Tower Case
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- Diamond 64-bit SVGA PCI Video Card w/2MB
- 101 Keyboard
- Everview ***15"*** SVGA NI Monitor

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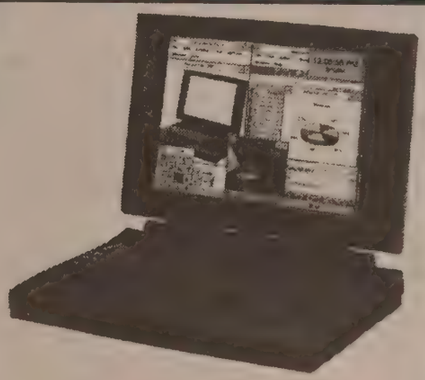

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- Local Bus Design
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Comtrade
CS Source
Dynasys
Kingsley Computer, Inc.
LTI Computer
Macro Computer
Ninth Generation
PC Club
PC Warehouse
Royal Electronics, Inc.
USA Systems

Claremont/Montclair/ Pomona/Rancho Cucamonga
Domino Computer
Computer Market Place
MS Computer

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Asean
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ATC Computer
ATS, Inc.
Creative Computers

Long Beach/ Paramount
KB Computer

Los Angeles
ATC
BMI
CompuTopia
CompuTek
Cygma Computer
Dav Tech
Einstein Computer
EZ Computer
Input Automation
ITG
LA Internet
Micro City
MIG Computer Systems
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Okidata
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3-6 Computers
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Silicon Ave.
Soft Hard Systems
Trade Tek
20/20
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Lightside, Inc.
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Micro City
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PC Warehouse
Quality Computer
Superior Computer
Symphony Computer
TSC Computer Products
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Hotel California
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Kinetic Cyber Systems
Melco International
New Technologies
PC Warehouse

Santa Clarita
CCS/All Micro Services

Santa Monica/Marina Del Rey
Authorized Service Technology
Cinenet Communications
Computer Business Center
Creative Computer
Micro League
Theta Computer

South Bay
Advanced Computer & Technology
Alltech Electronics
CD Dossier
DataByte
Domino Computer
Fry's
Input Automation
Kamfoz
KB Computer
Nova Software
Opto Computer
PC Warehouse

West Los Angeles
Active Business Computer
20/20 Technologies
Citicom
Goodman Music
LA Computer Center
Micro Base
Okidata
Unicomp Systems
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EZ Computer
Genesis Computer Systems, Inc.
Instruction Plus
Just CD's
MagicTek Computers
Micro DataNet
Silicon Avenue
ZyXEL

Brea
American Tech Enhance
Computer City
MicroSource
USM
Software Education of America
9th Generation

Buena Park/Cerritos/ Norwalk
Advanced Computer Center
Advanced Computer & Technology
Computer Business Center
Computer Marketplace
EKM Computer
Mars Computers
NET Computer

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Fry's
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CPU Chips

AMD 486 DX2 66	$175
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Pentium 66 MHz	$500
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CPU Chips

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Intel 486 DX2 66	*$180*
Pentium 60 MHz	*$380*
Pentium 66 MHz	*$500*
Pentium 90 MHz	*$625*

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210 MB.	*$160*
420 MB.	*$180*
540 MB.	*$220*

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50MHz Opal LX 486 SLC2-50 IBM	*ISA*	*$100*
66MHz AMD 486 DX2-66	*3VLB 256K*	*$285*
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(Run CD-I, MPEG-1 Video & Audio)

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8 RJ45, 1 AUI, 1 BNC	$135
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Ethernet Repeater

2 BNC, 2 AUI	$185
4 BNC, 4 AUI	$310

VLB Ethernet Cards

VLB, 3 in One (SMC Chip)	$99

Ethernet Adapters

NE2000, Combo, Jumperless	$35
NE2000, TP, Jumperless	$32
NE2000, BNC, Jumperless	$32
EISA 32 Bit, 3 in one	$160

Network Software

Personal NetWare	$53
-V3.12 5/10 User	$599/1299

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Pocket Ether TP + BNC	$99

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PCMCIA IC Lan Card BNC	$170
PCMCIA IC Lan Card UTP	$170
PCMCIA IC Combo Card	$185

100 Mb/s Fast Ethernet

Compatible with Cat. 3 or higher existing 4 Twisted Pair Cabling RJ45 Connections , Novell Certified

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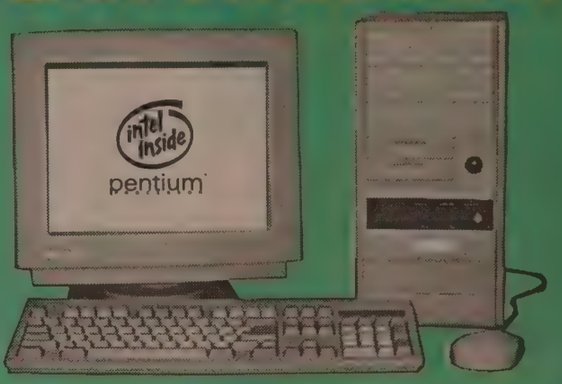

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- Intel Pentium 90MHz CPU, Neptune Chipset
- **MOTHERBOARD MANUFACTURED BY INTEL**
- 3 PCI Local Bus and 4 ISA Bus
- Heatsink w/Fan for Pentium Processor
- 256K Cache Memory
- **8MB RAM** Installed (Exp. to 128MB)
- HIGH QUALITY, FCC CLASS B MID-TOWER CASE w/230 WATT UL POWER SUPPLY
- 1.44MB TEAC Floppy Drive
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- Built-in PCI Enhanced IDE Controller Card
- Two High Speed Serial Port (16550 UART)
- S3 864 PCI Local Bus SVGA Graphics Accelerator Card w/1MB RAM
- 15" VESA Flat Screen, Low Radiation, Green Edge-to-Edge SVGA N.I. Monitor .28dp 1280x1024
- 101 Key Keyboard
- Hi-Resolution Mouse

Regular	CASH
$1945	**$1895**

PENTIUM 60 & 66MHz PCI LOCAL BUS SYSTEM

- Intel Pentium 60MHz or 66MHz Processor
- 4 PCI Local Bus and 4 ISA Bus
- Heatsink w/Fan for Pentium Processor
- 256K Cache Memory
- **8MB RAM** Installed (Exp. to 128MB)
- HIGH QUALITY, FCC CLASS B MID-TOWER CASE w/230 WATT UL POWER SUPPLY
- 1.44MB TEAC Floppy Drive
- **540MB IDE Hard Drive**
- PCI Enhanced IDE Controller Card
- 2 Serial, 1 Parallel, 1 Game Port
- S3 864 PCI Local Bus SVGA Graphics Accelerator Card w/1MB RAM
- 15" VESA Flat Screen, Low Radiation, Green Edge-to-Edge SVGA N.I. Monitor .28dp 1280x1024
- 101 Key Keyboard
- Hi-Resolution Mouse

	Regular	CASH
Pentium 60MHz	$1615	**$1575**
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486DX2/66MHz & 100MHz PCI LOCAL BUS SYSTEM

- Intel Processor & Pentium Overdrive Ready
- 4 PCI Local Bus, 3 VESA Local Bus & 4 ISA Slots
- Heatsink w/Fan
- 256K Cache Memory
- **8MB RAM** Installed (Exp. to 64MB)
- Mid-Tower Case w/230 Watt UL Power Supply
- 1.44MB TEAC Floppy Drive
- **540MB IDE Hard Drive**
- PCI Enhanced IDE Controller Card
- Two High Speed Serial Port (16550 DART)
- S3 864 PCI Local Bus SVGA Graphics Accelerator Card w/1MB RAM
- 15" VESA Flat Screen, Low Radiation, Green Edge-to-Edge SVGA N.I. .28dp 1280x1024
- 101 Key Keyboard
- Hi-Resolution Mouse

	Regular	CASH
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- 256K Cache Memory
- **8MB RAM** Installed (Exp. to 64MB)
- Mid-Tower Case w/230 Watt UL Power Supply
- 1.44MB TEAC Floppy Drive
- **540MB IDE Hard Drive**
- 32bit IDE Floppy/Hard Drive Controller Card
- 2 Serial, 1 Parallel, 1 Game Port
- VESA Local Bus SVGA Graphics Accelerator Card w/1MB, 1280x1024 16.7 Mil. Colors
- 14" N.I. Super VGA Color Monitor .28dp 1280x1024
- 101 Key Keyboard & Hi-Resolution Mouse
- **Creative Labs Sound Blaster 16 Sound Card**
- **Sony 55E Double Speed CD ROM**
- **14 CD Titles Software Package**
- **80 WATT AMPLIFIED SPEAKERS**
- **14.4 Voice Fax/Modem (999 Mail Boxes/Answers Calls/Fax Back)**

	Regular	CASH
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- Intel Processor & Pentium Overdrive Ready
- 3 VESA COMPLIANT LOCAL BUS Slots
- Heatsink w/Fan
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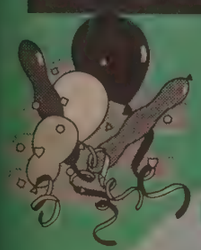

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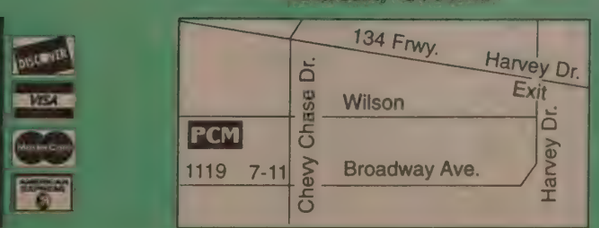

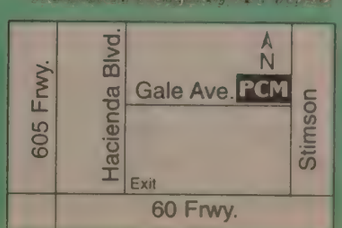

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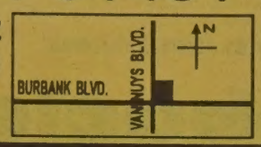

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DVORAK'S LAST COLUMN • BY JOHN C. DVORAK

The Pentium Debacle Redux

or

The Jokers Went Crazy On The Net With This One

It began with the announcement by Intel that the Pentium had a minor bug. It meant the chip's floating point unit was flawed. A lot of excuse-making was done by Intel, and one stock analyst said it would blow over in a day. I decided not to go with any of that guy's stock tips.

The Internet lit up with joke files. Here are some of the best ones I've picked off and some comments sent to me by friends.

Q&A: THE PENTIUM FDIV BUG

Q: How many Pentium designers does it take to screw in a lightbulb?
A: 1.99904274017, but that's close enough for nontechnical people.

Q: What do you get when you cross a Pentium PC with a research grant?
A: A mad scientist.

Q: What's another name for the "Intel Inside" sticker they put on Pentiums?
A: The warning label.

Q: What do you call a series of FDIV instructions on a Pentium?
A: Successive approximations.

Q: Complete the following word analogy: Add is to Subtract as Multiply is to:

1) Divide
2) Round
3) Random
4) On a Pentium, all of the above

A: Number 4.

Q: What algorithm did Intel use in the Pentium's floating point divider?
A: "Life is like a box of chocolates." (Source: F. Gump of Intel)

Q: Why didn't Intel call the Pentium the 586?
A: Because they added 486 and 100 on the first Pentium and got 585.999983605.

Q: According to Intel, the Pentium conforms to the IEEE standards 754 and 854 for floating point arithmetic. If you fly in aircraft designed using a Pentium, what is the correct pronunciation of "IEEE"?
A: Aaaaaaaiiiiiiiiieeeeeeeeeeee!

A Letter from Konstantinos M. Lahanas, Ph.D.

I woke up on Thanksgiving Day after having a dream, a very vivid dream on how owning a Pentium can make me very rich.

Let's say I'm administering a stock fund and I have to distribute $4,195,835 in dividends to...oh say 3,145,727 shares among investors. I grab my trusty $2500 Pentium equipped computer and figure that each should get $4,195,835/3,145,727= 1.333739068902 dollars per share.

> **Q:** What algorithm did Intel use in the Pentium's floating point divider?
>
> **A:** "Life is like a box of chocolates."
>
> *(Source: F. Gump of Intel)*

Being a stickler for numbers, I realize that $1.333739068902/share x 3,145,727 shares = $4,195,579. Hey...I could pocket $256 and no one will know the difference. So I do so, and by tinkering with various multiples of the above numbers I realize that this error in my favor exponentially increases as long as both numbers are multiplied by a power of two.

So I divert money and shares from all funds in my other portfolios into one fund until the total dividends and shares are a large multiple (say 1024) of the above numbers and presto, I've got $262,144. Now of course I don't work alone, and this student intern we've got, with a boat anchor 286, stumbles onto what's happening. The full-time guys all got Pentiums so they can't do math, either.

So then I found myself in court and telling the judge, "Hey it's just a coincidence. Intel says this kind of thing happens only once in...I don't know...27,000 years!!! I've got a technote to prove it."

I then woke up in a cold sweat.

Of course most people, according to Intel, don't do this kind of high-level complex math, they just buy Pentiums to run Doom. Just like my story wouldn't fly, neither will Intel's.

FAKE NEWS STORY

TOP TEN NEW INTEL SLOGANS FOR THE PENTIUM

9.9999973251 It's A FLAW, Dammit, Not A Bug
8.9999163362 It's Close Enough, We Say So
7.9999414610 Nearly 300 Correct Opcodes
6.9999831538 You Don't Need To Know What's Inside
5.9999835137 Redefining The PC— And Mathematics As Well
4.9999999021 We Fixed It, Really
3.9998245917 Division Considered Harmful
2.9991523619 Why Do You Think They Call It *Floating* Point?
1.9999103517 We're Looking For A Few Good Flaws
0.9999999998 The Errata Inside
0.9999999994 Intel Inside, But Can It Divide?

Random Comment

I guess Intel will soon announce the 586DX, a Pentium-class chip with a working FP unit. They will also announce that the current Pentium chips are *really* 586SX chips, so the floating point was not supposed to work in the first place.

And just think. This was just the first round of jokes!

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- Compact, portable design fits nearly into a briefcase
- Easy-to-add color with an optional HP Color kit (sold separately) just snap in the cartridge and print

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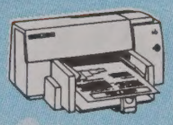

- Crisper, blacker blacks with 600 x 300 dpi printing plus HP's Resolution Enhancement Technology
- Easy-to-add color with an optional HP Color kit-just snap in the cartridge and print
- Easily handles a wide variety of paper sizes

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Outstanding print quality in black and color. This clear, sharp, professional quality printer with 600 x 300 dpi black output has HP's Resolution Enhancement Technology for smooth, crisp characters, fast text printing at up to 3 ppm for black and 4 mpp for color. 256 levels of grayscale, is energy efficient, and has a three year limited warranty.

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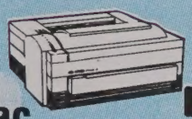
LaserJet 4ML Laser Printer for Mac



- 26 built-in scalable typefaces let you shrink and enlarge type to thousands of sizes.
- 300 dpi Laser printing with HP Resolution Enhancement Technology and microfine toner for smooth, sharp text and graphics.
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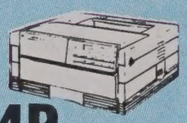

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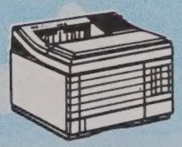

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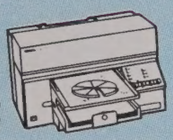

- 600 x 300 dpi black text at up to 7 pages per minute produces high-quality output at business speed.
- 300 dpi color at 1 to 2 minutes per page creates fast, high-quality output with bold, brilliant colors and true black.
- Plain-paper printing for both black and color saves money and allows convenient use of common office paper stationery.
- Built-in high-speed Centronics interface and optional HP JetDirect cards provide powerful, flexible connectivity.

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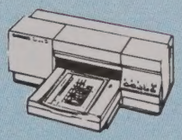

- 300 DPI Plain Paper
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- Prints on Transparency Film & Paper
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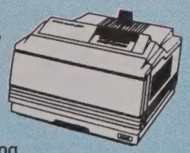

- HP's fastest desktop printer
- 16-ppm engine speed
- 33Mhz RISC processor with I/O buffering for unparalled performance.
- Handles a wide range of paper sizes

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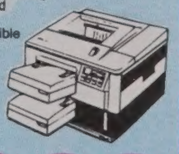

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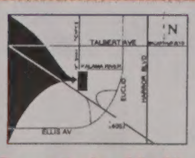

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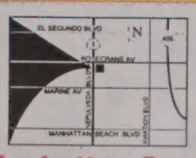

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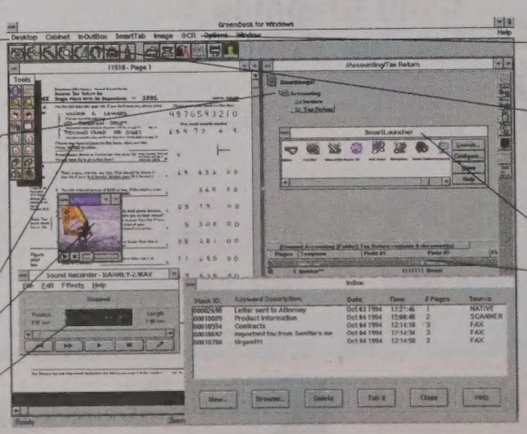

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